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MEDICO-CHIRURGICAL TRANSACTIONS.

PUBLISHED BY

THE ROYAL

MEDICAL AND CHIRURGICAL SOCIETY

OF

LONDON.

VOLUME THE FORTY-NINTH.

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LONGMANS, GREEN, AND CO.,
PATERNOSTER ROW.

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1805. WILLIAM SAUNDERS, M.D.
1808. MATTHEW BAILLIE, M.D.
1810. SIR HENRY HALFORD, Bart., M.D., G.C.H.
1813. SIR GILBERT BLANE, Bart., M.D.
1815. HENRY CLINE.
1817. WILLIAM BABINGTON, M.D.
1819. SIR ASTLEY PASTON COOPER, Bart., K.C.H., D.C.L.
1821. JOHN COOKE, M.D.
1823. JOHN ABERNETHY.
1825. GEORGE BIRKBECK, M.D.
1827. BENJAMIN TRAVERS.
1829. PETER MARK ROGET, M.D.
1831. WILLIAM LAWRENCE.
1833. JOHN ELLIOTSON, M.D.
1835. HENRY EARLE.
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1863. RICHARD PARTRIDGE.
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FELLOWS

OF THE

ROYAL MEDICAL AND CHIRURGICAL SOCIETY

OF LONDON.

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P.—President.	V.P.—Vice-President.
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The figures succeeding the words *Trans.* and *Pro.* show the number of Papers which have been contributed to the Transactions or Proceedings by the Fellow to whose name they are annexed. *Sci. Com.* is attached to the names of those who have served on the Scientific Committees of the Society.

OCTOBER, 1866.

Those marked thus (†) have paid the Composition Fee in lieu of further annual subscriptions.

Amongst the non-residents, those marked thus (*) are entitled by composition to receive the Transactions.

Elected

1841 *Abercrombie, James, M.D., Cape of Good Hope.

1846 *Abercrombie, John, M.D., Physician to the Cheltenham General Hospital, 13, Suffolk square, Cheltenham.

1851 *Acland, Henry Wentworth, M.D., F.R.S., Honorary Physician to H.R.H. the Prince of Wales; Physician to the Radcliffe Infirmary; Regius Professor of Medicine, and Clinical Professor in the University of Oxford.

1847 Acosta, Elisha, M.D., New York, U.S.

Elected

1842 Acton, William, 17, Queen Anne street, Cavendish square. *Trans.* 1.

1851 Adams, John, Surgeon to, and Lecturer on Descriptive and Surgical Anatomy at, the London Hospital; 10, Finsbury Circus. *Trans.* 3.

1852 Adams, William, Surgeon to the Royal Orthopædic Hospital; 5, Henrietta street, Cavendish square. *Trans.* 2.

1837 *Ainsworth, Ralph Fawsett, M.D., Physician to the Manchester Royal Infirmary; Cliff Point, Lower Broughton, Manchester.

1839 Alcock, Sir Rutherford, K.C.B., K.C.T., K.T.S., D.C.L., H.M.'s Envoy Extraordinary at the Court of Pekin. *Trans.* 1.

1826 Alderson, James, M.D., F.R.S., *President,* Senior Physician to, and Lecturer on Clinical Medicine at, St. Mary's Hospital; 17, Berkeley square. S. 1829. C. 1848. T. 1849. V.P. 1852-3. P. 1865-6. *Trans.* 3.

1843 Aldis, Charles James Berridge, M.D., Medical Officer of Health for St. George's, Hanover square; Senior Physician to the Surrey Dispensary; and Physician to the St. Paul and St. Barnabas Dispensary; 1, Chester terrace, Chester square. *Trans.* 2.

1850 Alexander, Charles Revans, Surgeon to the Royal Infirmary for Diseases of the Eye; 6, Cork street, Bond street.

1866 Allbutt, Thomas Clifford, B.A. and B.M. Camb., Lecturer on the Practice of Physic at the Leeds School of Medicine, and Physician to the Leeds General Infirmary; 12, Park square, Leeds. *Trans.* 2.

1863 Althaus, Julius, M.D., Physician to the Royal Infirmary for Diseases of the Chest; 18, Bryanston street, Portman square.

1862 Andrew, Edwyn, M.D., Windsor House, Shrewsbury.

1862 Andrew, James, M.D., Assistant Physician to St. Bartholomew's Hospital; 59, Russell square.

1820 Andrews, Thomas, M.D., Norfolk, Virginia.

Elected

1819 †Arnott, James Moncrieff, F.R.S., Chapel House, Lady Bank, Fifeshire. L. 1826-8. V.P. 1832-3. T. 1835-40. C. 1846, 1855-6. P. 1847-8. *Trans.* 8.

1817 †Ashburner, John, M.D., F.L.S., 7, Hyde park place, Cumberland gate. C. 1821, 1830-1.

1851 Ashton, Thomas John, Consulting Surgeon to the St. Marylebone Infirmary; 31, Cavendish square.

1820 *Badley, John, Dudley, Worcestershire.

1840 Bainbridge, William, 31, Bridge street, Southwark.

1836 Baird, Andrew Wood, M.D., Physician to the Dover Hospital; Dover, Kent.

1851 *Baker, Alfred, Surgeon to the Birmingham General Hospital, and Lecturer on Surgery at Sydenham College; Cannon street, Birmingham.

1865 Baker, William Morrant, Demonstrator of Anatomy, St. Bartholomew's Hospital; the College, St. Bartholomew's Hospital. *Trans.* 2.

1839 †Balfour, Thomas Graham, M.D., F.R.S., Deputy Inspector-General of Hospitals; 6, Whitehall yard. C. 1852-3. V.P. 1860-1. *Trans.* 2.

1848 Ballard, Edward, M.D., Medical Officer of Health for Islington; 7, Compton terrace, Upper street, Islington. *Trans.* 2.

1849 Ballard, Thomas, M.D., 10, Southwick place, Hyde park.

1866 *Banks, John Thomas, M.D., King's Professor of Physic, Physician to Richmond, Whitworth, and Hardwicke Hospitals, and Sir Patrick Dun's Hospital; Consulting Physician to the Coombe Hospital; 10, Merrion square east, Dublin.

1847 Barclay, Andrew Whyte, M.D., Physician to, and Lecturer on Medicine at, St. George's Hospital; Medical Officer of Health for Chelsea; 23a, Bruton street, Berkeley square. S. 1857-60. L. 1861-2. C. 1865-6. *Trans.* 2.

1848 Barker, Edgar, 9, Oxford square, Hyde park.

1862 Barker, Edgar, jun., late Surgeon to the Western General Dispensary; 6, Upper Hyde park street.

Elected

1833 †Barker, Thomas Alfred, M.D., Senior Physician to, and Lecturer on Clinical Medicine at, St. Thomas's Hospital; 27, Wimpole street. C. 1844-5. V.P. 1853-4. T. 1860-2. *Trans.* 6.

1861 Barnes, Robert, M.D., Obstetric Physician to, and Lecturer on Midwifery at, St. Thomas's Hospital, and Physician to the Royal Maternity Charity; 46, Finsbury square. *Trans.* 3.

1864 Barratt, Joseph Gillman, M.D., Physician to the London Surgical Home; 8, Cleveland gardens, Bayswater.

1840 Barrow, Benjamin, Surgeon to the Royal Isle of Wight Infirmary; Clifton House, Ryde, Isle of Wight.

1859 Barwell, Richard, Assistant-Surgeon to, and Lecturer on Surgical Anatomy at, the Charing Cross Hospital; 32, George street, Hanover square. *Trans.* 1.

1844 Basham, William Richard, M.D., Senior Physician to, and Lecturer on Medicine at, the Westminster Hospital; 17, Chester street, Grosvenor place. S. 1852-4. C. 1860-1. V.P. 1864-5. *Trans.* 2.

1862 Bazire, Pierre Victor, M.D., Assistant-Physician to the National Hospital for the Paralysed and Epileptic; 28, Woburn square.

1862 Beale, Lionel Smith, M.B., F.R.S., Professor of Physiology and General and Morbid Anatomy in King's College, London, and Physician to King's College Hospital; 61, Grosvenor street.

1860 Bealey, Adam, M.D., M.A. Camb., Physician to the Royal General Dispensary, St. Pancras; 27, Tavistock square.

1841 Beaman, George, M.D., 3, Henrietta street, Covent Garden.

1856 Beardsley, Amos, Bay villa grange, Newton in Cartmel, Lancashire.

1865 Beattie, Henry, M.D., 26, Bloomsbury street, Bedford sq.

1836 Beaumont, William Rawlings, Consulting Surgeon to the Toronto General Hospital, late Professor of Surgery in the University of King's College; Toronto, Canada West. *Trans.* 3.

Elected

1840 Beevor, Charles, 129, Harley street.

1858 Begley, William Chapman, M.D., Middlesex County Lunatic Asylum, Hanwell.

1819 †Bell, Thomas, F.R.S., F.L.S., The Wakes, Selborne, Hants. C. 1832-3. V.P. 1854. *Trans.* 1.

1847 Bennet, James Henry, M.D., The Ferns, Weybridge, and Mentone.

1845 Berry, Edward Unwin, 76, Gower street, Bedford Square.

1820 Bertin, Stephen, Paris.

1865 *Bickersteth, Edward Robert, Surgeon to the Royal Infirmary, Liverpool, and Lecturer on Clinical Surgery in the Liverpool School of Medicine; 2, Rodney street, Liverpool.

1815 †Billing, Archibald, M.D., F.R.S., Member of the Senate of the University of London; 6, Grosvenor gate. C. 1825. V.P. 1828-9.

1827 Birch, William, Barton-under-Needwood, Staffordshire. *Trans.* 2.

1855 Bird, Peter Hinckes, F.L.S., 1, Norfolk square, Hyde park.

1856 Bird, William, Surgeon to the West London Hospital; 7, George street, Hanover square.

1849 Birkett, Edmund Lloyd, M.D., Physician to the City of London Hospital for Diseases of the Chest; 48, Russell square. C. 1865-6.

1851 Birkett, John, F.L.S., Surgeon to, and Lecturer on Surgery at, Guy's Hospital; 59, Green street, Grosvenor square. L. 1856-7. S. 1863-5. *Trans.* 4. *Sci. Com.*

1846 Birt, Hugh.

1843 Black, Patrick, M.D., *Vice-President*, Physician to, and Lecturer on Medicine at, St. Bartholomew's Hospital; 11, Queen Anne street, Cavendish square. C. 1856. V.P. 1866.

1847 Blackman, George C., M.D., Professor of Surgery in the Medical College of Ohio; New York, U.S.

1840 Blakiston, Peyton, M.D., F.R.S., St. Leonard's-on-Sea.

Elected

1865 Blanchet, Hilarion, Examiner to the College of Physicians and Surgeons, Lower Canada; 6, Palace street, Quebec, Canada East.

1865 Blandford, George Fielding, M.B., 3, Clarges street, Piccadilly.

1823 Bojanus, Louis Henry, M.D., Wilna.

1846 Bostock, John Ashton, Hon. Surgeon to H.M. the Queen; Surgeon-Major Scots Fusilier Guards; 54, Chester square, Belgravia. C. 1861-2.

1863 Bowen, Francis, M.D., 62, Upper Berkeley street, Portman square.

1841 Bowman, William, F.R.S., Surgeon to the Royal London Ophthalmic Hospital, Moorfields; 5, Clifford street, Bond street. C. 1852-3. V.P. 1862. *Trans.* 3.

1862 Brace, William Henry, Surgeon to the Bath United Hospital; 1, Gay street, Bath.

1857 Brinton, William, M.D., F.R.S., 24, Brook street, Grosvenor square.

1851 Brodhurst, Bernard Edward, Assistant-Surgeon to St. George's Hospital, and to the Royal Orthopædic Hospital; 20, Grosvenor street. *Trans.* 2; *Pro.* 1.

1844 †Brooke, Charles, M.A., F.R.S., *Librarian*, Surgeon to, and Lecturer on Surgery at, the Westminster Hospital; 16, Fitzroy square. C. 1855. L. 1866.

1854 *Brown, Henry, Surgeon to H.M. the Queen, and the Royal Household; Windsor.

1857 *Brown, Robert, Surgeon to the Carlisle Dispensary; 4, Devonshire street, Carlisle.

1860 Brown-Sequard, Charles Edouard, M.D., F.R.S., Paris. *Sci. Com.*

1851 Browne, Alexander, M.D., Twynholm, Kirkcudbright.

1860 Bryant, Thomas, Assistant-Surgeon to, and Demonstrator of Operative Surgery at, Guy's Hospital; 2, Finsbury square. *Trans.* 5; *Pro.* 1. *Sci. Com.*

1855 Bryant, Walter John, L.R.C.P. Edinb.; 23a, Sussex square, Hyde park gardens.

1823 Buchanan, B. Bartlet, M.D.

Elected

1864 Buchanan, George, M.D., Physician to the London Fever Hospital, and Assistant-Physician to the Hospital for Sick Children; Medical Inspector for the Privy Council; Medical Officer of Health for St. Giles District; 53, Harley street, Cavendish square.

1864 Buckle, Fleetwood, M.D., 1, Albert square, Clapham road.

1839 Budd, George, M.D., F.R.S., Consulting Physician to the Seamen's Hospital Ship, 'Dreadnought;' 20, Dover street, Piccadilly. C. 1846-7. V.P. 1857. *Trans.* 5.

1833 †Burrows, George, M.D., F.R.S., President of the Medical Council; Consulting Physician to St. Bartholomew's Hospital; Physician to Christ's Hospital; Member of the Senate, University of London; 18, Cavendish square. C. 1839-40, 1858-9. T. 1845-7. V.P. 1849-50. *Trans.* 2.

1820 Burrows, Samuel.

1837 Busk, George, F.R.S., F.L.S., *Treasurer*, Surgeon to the Seamen's Hospital Ship 'Dreadnought;' 32, Harley street, Cavendish square. C. 1847-8. V.P. 1855. T. 1866. *Trans.* 4.

1818 Butter, John, M.D., F.R.S., F.L.S., Physician Extraordinary to the Plymouth Royal Eye Infirmary; Windsor villas, Plymouth.

1851 *Cadge, William, Surgeon to the Norfolk and Norwich Hospital; 24, St. Giles's street, Norwich. *Trans.* 1.

1851 Callaway, Thomas, Maison Limozin, Place Bresson, Algiers.

1861 Callender, George William, Assistant-Surgeon to, and Lecturer on Anatomy at, St. Bartholomew's Hospital; 47, Queen Anne street, Cavendish square. *Trans.* 1. *Sci. Com.*

1852 *Canney, George, M.D., Bishop-Auckland, Darlington, Durham.

1847 Carlill, John Burford, M.D., Surgeon-Accoucheur to the Newman street Lying-in Institution; 57, Berners street.

1853 Carter, Robert Brudenell, Stroud, Gloucestershir.

Elected

1845 Cartwright, Samuel, Professor of Dental Surgery at King's College, London; Surgeon-Dentist to King's College Hospital; 32, Old Burlington street. C. 1860-1. *Sci. Com.*

1839 Cathrow, William, 42, Weymouth street, Portland place. C. 1860-1.

1845 Chalk, William Oliver, Surgeon to the St. Marylebone Eye and Ear Institution; 3, Nottingham terrace, York gate, Regent's park.

1844 Chambers, Thomas King, M.D., Hon. Physician to H.R.H. the Prince of Wales; Consulting Physician to, and Lecturer on Medicine at, St. Mary's Hospital; Consulting Physician to the Lock Hospital; 22B, Brook street, Grosvenor square. *Trans.* 1. C. 1861.

1859 Chance, Frank, M.D., 27, Eversfield place, St. Leonard's-on-Sea.

1849 Chapman, Frederick, Old Friars, Richmond green, Surrey.

1837 Chapman, Henry Thomas, 16, Lower Seymour street, Portman square. C. 1858.

1852 Childs, George Borlase, Surgeon-in-Chief to the City Police Force, and Surgeon to the Metropolitan Free Hospital; 11, Finsbury place south.

1865 Cholmeley, William, M.D., Physician to the Great Northern Hospital; 40, Russell square.

1842 Chowne, William Dingle, M.D., Physician to, and Lecturer on Medicine and Midwifery at, the Charing Cross Hospital; Corresponding Fellow of the Royal Academy of Surgery of Madrid; 8, Connaught place West, Hyde park. C. 1853-4.

1866 Church, William Selby, M.D., Reader in Anatomy, Christ Church, Oxford; Lecturer on Comparative Anatomy at St. Bartholomew's Hospital; 1, Harcourt buildings, Temple.

1860 Clark, Andrew, M.D., Physician to, and Lecturer on Medicine at, the London Hospital; 23, Montague place, Russell square.

Elected

1839 †Clark, Frederick Le Gros, Surgeon to, and Lecturer on Surgery at, St. Thomas's Hospital; Surgeon to the Magdalen Hospital; Examiner in Surgery in the University of London, and late Examiner in Surgery to the Royal College of Physicians; Consulting Surgeon to the Royal Surrey County Hospital, to the Western General Dispensary, and to the London Female Penitentiary, Pentonville; 14, St. Thomas's street, Southwark, and Lee, Kent. S. 1847-9. V.P., 1855-6. *Trans.* 3.

1848 Clarke, John, M.D., Obstetric Physician to, and Lecturer on Midwifery at, St. George's Hospital; Physician to the General Lying-in Hospital; 42, Hertford street, May fair. C. 1866.

1861 *Clarke, William James, Surgeon to the Huddersfield Infirmary; John William street, Huddersfield, Yorkshire.

1866 Clarke, William Fairlie, 1, Curzon street, May fair.

1850 Clarkson, Josiah, New Hall street, Birmingham. *Trans.* 1.

1842 Clayton, Oscar Moore Passey, 5, Harley street. C. 1865.

1853 Clover, Joseph Thomas, 3, Cavendish place, Cavendish square.

1857 Coates, Charles, F.R.C.P., Edinb., Physician to the Bath United General Hospital; 10, Circus, Bath.

1851 Cock, Edward, Senior Surgeon to, and Lecturer on Clinical Surgery at, Guy's Hospital; Consulting Surgeon to the Asylum for Deaf and Dumb; Dean Street south, Tooley street, Southwark. C. 1857. *Trans.* 3.

1850 Cohen, Daniel Whitaker, M.D.; 26, Oxford rd., Kilburn.

1835 *Colborne, William, Chippenham, Wiltshire.

1818 Cole, Robert, F.L.S., Holybourne, Hampshire.

1855 Collins, Frederick, M.D., Medical Officer of Health for Wanstead; Wanstead lodge, Essex.

1840 *Cooke, William Robert, 2, Carlton villas, Hencroft street, Slough.

1865 Cooper, Alfred, Assistant-Surgeon to St. Mark's Hospital; 70, Jermyn street, Piccadilly.

1819 Cooper, George, Brentford, Middlesex.

Elected

1841 Cooper, George Lewis, one of the Surgeons to the National Vaccine Institution, and Teacher of Vaccination to the Medical School of University College; Surgeon to the Bloomsbury Dispensary; 7, Woburn Place, Russell square. C. 1860-1. *Trans.* 1.

1843 Cooper, William White, Surgeon-Oculist in Ordinary to H.M. the Queen; and Hon. Consulting Ophthalmic Surgeon to St. Mary's Hospital; 19, Berkeley square. C. 1858-9.

1841 Coote, Holmes, Surgeon to, and Lecturer on Surgery at, St. Bartholomew's Hospital; 7, Princes street, Hanover square. S. 1853-4. C. 1864-5. *Trans.* 2.

1835 Copeland, George Ford, Cheltenham.

1822 †Copland, James, M.D., F.R.S., Consulting Physician to the Royal Infirmary for Children, and to the Great Northern Hospital; Hon. Fellow of the Royal Academy of Sciences of Sweden, &c.; 5, Old Burlington street. C. 1831. V.P. 1838-9. P. 1853-4.

1851 Corbet, John. *Trans.* 2.

1860 *Corry, Thomas Charles Steuart, M.D., Surgeon to the Belfast General Dispensary; 9, Clarendon place, Belfast.

1839 *Corsellis, Charles Cæsar, M.D., F.L.S., Benson, Oxon.

1853 Cory, William Gillett, M.D.

1847 Cotton, Richard Payne, M.D., Physician to the Hospital for Consumption and Diseases of the Chest; 46, Clarges street, Piccadilly. C. 1863.

1828 †Coulson, William, Hon. Consulting Surgeon to St. Mary's Hospital, and to the German Hospital; 2, Frederick's place, Old Jewry, and 1, Chester terrace, Regent's park. C. 1831. L. 1832-7. V.P. 1851-2. *Trans.* 1.

1864 Coulson, Walter John, Surgeon to the Lock Hospital, and Assistant-Surgeon to St. Mary's Hospital; 29, St. James's place.

1860 †Couper, John, Assistant-Surgeon to the London Hospital; 33, Finsbury Circus.

1862 Cowell, George, Surgeon to the St. George's and St. James's Dispensary; 65, Belgrave Road, Pimlico.

Elected

1841 Crawford, Mervyn Archdall Nott, M.D., Wiesbaden. C. 1853-4.

1847 Critchett, George, Surgeon to the Royal London Ophthalmic Hospital, Moorfields; 29, Harley street, Cavendish square. C. 1865. *Trans.* 1.

1862 Crompton, Samuel, 17a, Princess street, Manchester.

1837 Crookes, John Farrar, 5, Waterloo Crescent, Dover.

1860 Cross, Richard, M.D., Queen Street, Scarborough.

1849 *Crowfoot, William Edward, Beccles, Suffolk.

1851 Cumming, James Cameron, M.D., 1, Cadogan place, Sloane street.

1865 Curgenven, J. Brendon, 11, Craven hill gardens, Bayswater.

1846 Curling, Henry, Surgeon to the Margate Royal Sea-Bathing Infirmary, and the Ramsgate Seamen's Infirmary; Ramsgate, Kent.

1837 Curling, Thomas Blizard, F.R.S., Surgeon to the London Hospital; 39, Grosvenor street. S. 1845-6. C. 1850. T. 1854-7. V.P. 1859. *Trans.* 13. *Pro.* 1. *Sci. Com.*

1847 Currey, John Edmund, M.D., Lismore, County Waterford.

1822 Cusack, Christopher John, Chateau d'Eu, France.

1852 Cutler, Thomas, M.D., Acting Physician at the Spa Waters; Spa, Belgium.

1836 *Daniel, James Stock, Ramsgate, Kent.

1848 Daubeny, Henry.

1846 Davies, Frederick, M.D., 124, Gower street, Bedford sq.

1847 Davies, John, M.D., Physician Extraordinary to the Hertford General Infirmary, and Visiting Physician to the Hadham Palace Lunatic Asylum, Hertford.

1853 Davies, Robert Coker Nash, Rye, Sussex.

1852 Davies, William, M.D., 10, Gay street, Bath.

1852 Davis, John Hall, M.D., Physician Accoucheur to, and Lecturer on Midwifery at, the Middlesex Hospital; Physician to the Royal Maternity Charity, and Consulting Physician-Accoucheur to the St. Pancras Infirmary; 24, Harley street, Cavendish square.

1818 Dawson, James, Wray Castle, Windermere.

Elected

1847 Day, George Edward, M.D., F.R.S., Emeritus Professor of Medicine in the University of St. Andrew's; Furzewell House, Torquay.

1858 Delima, Teofilo, M.D., Caracas, Venezuela, South America.

1846 *Denton, Samuel Best, M.D., Ivy Lodge, Hornsea, Hull.

1859 Dickinson, William Howship, M.D., Assistant-Physician to, and Lecturer on Materia Medica at, St. George's Hospital; Assistant-Physician to the Hospital for Sick Children; 11, Chesterfield Street, May fair. *Trans.* 6.

1844 Dickson, Robert, M.D., F.L.S., Physician to the Scottish Hospital; 16, Hertford street, May fair. C. 1860.

1839 †Dixon, James, Surgeon to the Royal London Ophthalmic Hospital, Moorfields; and Consulting Ophthalmic Surgeon to the Asylum for Idiots; 2, Portman square. L. 1849-55. V.P., 1857-8. T. 1863-4. C. 1866. *Trans.* 4.

1862 Dobell, Horace B., M.D., Physician to the Royal Infirmary for Diseases of the Chest, City road; 84, Harley street. *Trans.* 1.

1845 Dodd, John.

1857 Douglas, Archibald, M.D., 8, Clifton place, Sussex square, Hyde park.

1863 Down, John Langdon Haydon, M.D., Assistant-Physician to, and Lecturer on Materia Medica and Therapeutics at, the London Hospital; Physician to the Asylum for Idiots, Earlswood, Redhill. *Trans.* 2.

1853 Druitt, Robert, M.R.C.P., Medical Officer of Health for St. George's, Hanover square; 37, Hertford Street, May fair. *Trans.* 2.

1865 Drysdale, Charles Robert, M.D., Physician to the Farringdon Dispensary; 99, Southampton Row, Russell square.

1865 Duckworth, Dyce, M.D., Medical Tutor to St. Bartholomew's Hospital; Assistant-Physician to the Royal General Dispensary; 70, Wimpole Street.

1845 Duff, George, M.D., High street, Elgin.

1845 Duffin, Edward Willson, 18, Devonshire Street, Portland place. *Trans.* 1.

Elected

1833 †Dunn, Robert, 31, Norfolk street, Strand. C. 1845-6. *Trans.* 2.

1861 Du Pasquier, Claudius Francis, Surgeon-Apothecary to H.M. the Queen, and to the Household of H.R.H. the Prince of Wales; 62, Pall Mall.

1863 Durham, Arthur Edward, Assistant-Surgeon to, and Lecturer on Anatomy at, Guy's Hospital; 30, Brook street, Grosvenor square. *Trans.* 2.

1843 Durrant, Christopher Mercer, M.D., Physician to the East Suffolk and Ipswich Hospital; Ipswich, Suffolk.

1839 Dyer, Henry Sumner, M.D., 37, Bryanston square. C. 1854-5.

1836 Earle, James William, late of Norwich.

1824 Edwards, George.

1823 Egerton, Charles Chandler, Kendall Lodge, Epping.

1861 *Elliot, Robert, M.D., Physician to the Carlisle Dispensary; 18, Lowther street, Carlisle.

1848 Ellis, George Viner, Examiner in Anatomy at the University of London; Professor of Anatomy in University College, London. C. 1863-4. *Trans.* 2.

1854 *Ellison, James, M.D., Surgeon in Ordinary to the Royal Household, Windsor; 14, High street, Windsor.

1835 England, William, M.D., Ipswich, Suffolk.

1842 Erichsen, John, Professor of Clinical Surgery in University College, London, and Surgeon to University College Hospital; Examiner in Surgery at the University of London; 6, Cavendish place, Cavendish square. C. 1855-6. *Trans.* 2.

1836 Evans, George Fabian, M.D., Physician to the General Hospital, Birmingham.

1815 *Evans, Griffith Francis Dorsett, M.D.; Trewern, Montgomeryshire. C. 1838.

1845 Evans, William Julian, M.D., Pinner, Middlesex.

1864 Fagge, Charles Hilton, M.D., Physician to the Royal Infirmary for Diseases of Children and Women, Waterloo road; 43, Trinity square, Southwark.

Elected

1858 Falconer, Randle Wilbraham, M.D., Physician to the Bath United Hospital; 22, Bennett street, Bath.

1862 Farquharson, Robert, M.D., Coldstream Guards' Hospital, Vincent square, Westminster.

1844 Farre, Arthur, M.D., F.R.S., Physician-Accoucheur to H.R.H. the Princess of Wales and H.R.H. the Princess Louis of Hesse; 12, Hertford street, May fair. C. 1857. V.P. 1864. *Sci. Com.*

1863 Fenwick, Samuel, M.D., Assistant-Physician to the City of London Hospital for Diseases of the Chest; 31, Harley street, Cavendish square. *Trans.* 3.

1841 Fergusson, Sir William, Bart., F.R.S., Surgeon Extraordinary to H.M. the Queen; Professor of Surgery in King's College, London, and Surgeon to King's College Hospital; 16, George street, Hanover square. C. 1849-50. V.P. 1863-4. *Trans.* 4.

1852 *Field, Alfred George, Surgeon to St. Mary's Hospital, Brighton; 28, Old Steine, Brighton.

1849 Fincham, George Tupman, M.D., Physician to, and Lecturer on Clinical Medicine at, the Westminster Hospital; 13, Belgrave road.

1866 Fish, John Crockett, M.B., 8, Fitzroy square.

1836 Fisher, Sir John William, 5, Grosvenor gate. C. 1843-4.

1860 Fitzgerald, Thomas George, Staff-Surgeon; 6, Whitehall yard.

1866 Fitzpatrick, Thomas, M.D., M.A., Dublin; 5, Burwood place, Hyde park.

1842 Fletcher, Thomas Bell Elcock, M.D., Physician to the Birmingham General Hospital; Waterloo street, Birmingham. *Trans.* 1.

1864 *Folker, William Henry, Surgeon to the North Staffordshire Infirmary; Hanley, Stoke-on-Trent, Staffordshire.

1848 Forbes, John Gregory, Surgeon to the Metropolitan Convalescent Institution; 9, Devonport street, Hyde park. *Trans.* 2.

Elected

1852 †Forster, John Cooper, Assistant-Surgeon to, and Lecturer on Anatomy at, Guy's Hospital; Surgeon to the Royal Infirmary for Children, &c.; 10, St. Thomas's street, Southwark. *Pro.* 1.

1865 Foster, Balthazar Walter, M.D., Professor of Anatomy at the Queen's College, Birmingham, and Assistant-Physician to the Queen's Hospital; 4, Old Square, Birmingham.

1859 Fox, Edward Long, M.B., Physician to the Bristol Royal Infirmary; 1, Chesterfield place, Clifton.

1858 *Fox, Wilson, M.D., Professor of Pathological Anatomy in University College, London, and Physician to University College Hospital; 22B, Cavendish square. *Trans.* 2.

1841 Franz, John Christopher Augustus, M.D.

1843 Fraser, Patrick, M.D., Physician to the London Hospital, and to the London Dispensary; 63, Grosvenor street. C. 1866.

1836 †French, John George, Surgeon to the St. James's Infirmary; 41, Great Marlborough street. C. 1852-3.

1849 Frere, Robert Temple, M.A., F.R.C.P., 143, Harley street.

1846 Fuller, Henry William, M.D., Physician to St. George's Hospital; 13, Manchester square. C. 1862. S. 1864-5. *Trans.* 2.

1864 *Gairdner, William Tennant, M.D., Professor of the Practice of Medicine in the University of Glasgow; Physician to the Glasgow Royal Infirmary; 21, Blythswood square, Glasgow.

1865 Gant, Frederick James, Surgeon and Pathological Anatomist to the Royal Free Hospital; 16, Connaught square, Hyde park.

1854 Garrod, Alfred Baring, M.D., F.R.S., Professor of Materia Medica in King's College, London, and Physician to King's College Hospital; 11, Harley street, Cavendish square. *Trans.* 8.

Elected

1857 Gascoyen, George Green, *Secretary*, Surgeon to the Lock Hospital; Assistant-Surgeon to, and Lecturer on Descriptive and Surgical Anatomy at, St. Mary's Hospital; 48, Queen Anne street, Cavendish square. S. 1866. *Trans.* 1. *Sci. Com.*

1851 Gaskoin, George, 3, Westbourne park.

1819 Gaulter, Henry.

1848 Gay, John, Senior Surgeon to the Great Northern Hospital, and Consulting Surgeon to the Asylum for Idiots; 10, Finsbury place south.

1866 Gee, Samuel Jones, M.D., Assistant-Physician to the Hospital for Sick Children; 46, Queen Anne street, Cavendish square.

1821 *George, Richard Francis, late Senior Surgeon to the Bath General Hospital; 20, Marlborough buildings, Bath.

1864 Gibb, George Duncan, M.D., LL.D., M.A., Assistant-Physician to, and Lecturer on Forensic Medicine at, the Westminster Hospital; 1, Bryanston street, Portman square. *Trans.* 1.

1858 Godfrey, Benjamin, M.D., Carlton House, Enfield, Middlesex.

1851 Goodfellow, Stephen Jennings, M.D., Physician to the Middlesex Hospital; 5, Savile row, Burlington gardens. C. 1864-5. *Trans.* 2.

1818 Gordon, James Alexander, M.D., C.B., F.R.S., Pixholme, near Dorking, Surrey. C. 1828. V.P. 1829. *Trans.* 1.

1862 Goulstone, John G., M.D., 30, Clarence street, Liverpool.

1851 Gowlland, Peter Yeames, Surgeon to St. Mark's Hospital; 34, Finsbury square.

1844 Grantham, John, Crayford, Kent.

1846 Gream, George Thompson, M.D., Physician-Accoucheur to H.R.H. the Princess of Wales; 2, Upper Brook street, Grosvenor square. C. 1863.

1843 Greenhalgh, Robert, M.D., Physician-Accoucheur to, and Lecturer on Midwifery at, St. Bartholomew's Hospital, and Consulting Physician to the Samaritan Free Hospital for Women and Children, and to the City of London Lying-in Hospital; 77, Grosvenor street.

Elected

1860 Greenhow, Edward Headlam, M.D., Assistant-Physician to, and Lecturer on Public Health and on Medical Jurisprudence at, the Middlesex Hospital, and Consulting Physician to the Western General Dispensary; 77, Upper Berkeley street, Portman square. *Trans.* 2.

1814 Grove, John, M.D., Salisbury.

1852 Grove, John, West Hill, Wandsworth, Surrey.

1860 Gueneau de Mussy, Henry, M.D., 4, Cavendish place, Cavendish square.

1849 Gull, William Withey, M.D., Member of the Senate of the University of London; 26, Brook street, Grosvenor square. C. 1864. *Trans.* 2.

1837 Gully, James Manby, M.D.; Great Malvern, Worcestershire.

1854 Habershon, Samuel Osborne, M.D., Physician to, and Lecturer on Materia Medica and Therapeutics at, Guy's Hospital; Examiner in Materia Medica at the University of London; 22, Wimpole street, Cavendish square. *Trans.* 2.

1849 Hailey, Hammett, Newport Pagnell, Bucks.

1848 Halley, Alexander, M.D., F.G.S., 16, Harley street, Cavendish square.

1819 †Hammerton, Thomas, 112, Piccadilly. C. 1829-30.

1838 Hancock, Henry, Surgeon to, and Lecturer on Surgery at, the Charing Cross Hospital; Surgeon to the Royal Westminster Ophthalmic Hospital; Professor of Anatomy and Surgery at the Royal College of Surgeons; 76, Harley street, Cavendish square. C. 1851.

1849 *Hansard, Richard James, late Surgeon to the Radcliffe Infirmary, Oxford.

1848 *Harcourt, George, M.D., Chertsey, Surrey.

1836 Harding, John Fosse, Mount Sandford, Southborough, Tunbridge Wells. C. 1858-9.

1856 Hare, Charles John, M.D., Professor of Clinical Medicine in University College, London; and Physician to University College Hospital; 41, Brook street, Grosvenor square.

Elected

1857 HARLEY, GEORGE, M.D., F.R.S., Professor of Medical Jurisprudence in University College, London; and Physician to University College Hospital; 25, Harley street, Cavendish square. *Trans.* 1. *Sci. Com.* 2.

1864 HARLEY, JOHN, M.D., F.L.S., Assistant-Physician to the London Fever Hospital; 78, Upper Berkeley street, Portman square. *Trans.* 2.

1866 HARPER, PHILIP H., 30, Cambridge street, Hyde park.

1859 HARRIS, FRANCIS, M.D., Assistant-Physician to, and Lecturer on Botany at, St. Bartholomew's Hospital; Assistant-Physician to the Hospital for Sick Children; 24, Cavendish square.

1841 HARVEY, WILLIAM, Surgeon to the Royal Dispensary for Diseases of the Ear, and to the Freemasons' Female Charity, and Aural Surgeon to the Great Northern Hospital; 2, Soho square. C. 1854.

1855 HAVILAND, ALFRED, Surgeon to the Bridgewater Infirmary, Bridgewater, Somerset.

1828 †HAWKINS, CÆSAR HENRY, F.R.S., Sergeant-Surgeon to H.M. the Queen, and Consulting Surgeon to St. George's Hospital; 26, Grosvenor street. C. 1830-1, 1860. V.P. 1838-9. T. 1841-4. P. 1855-6. *Trans.* 12.

1838 †HAWKINS, CHARLES, Inspector of Anatomical Schools in London; Consulting Surgeon to Queen Charlotte's Hospital; 27, Savile row, Burlington gardens. C. 1846-7. S. 1850. V.P. 1858. T. 1861-2. *Trans.* 2.

1848 HAWKSLEY, THOMAS, M.D., Physician to the Margaret street Dispensary for Consumption and Diseases of the Chest; 70, Brook street, Hanover square.

1860 HAYWARD, HENRY HOWARD, Assistant-Dental Surgeon to the Dental Hospital of London; Dental Surgeon to the Hospital for Consumption, Brompton; 38, Harley street, Cavendish square.

1861 HAYWARD, WILLIAM HENRY, Church House, Oldbury, near Birmingham.

1848 *HEALE, JAMES NEWTON, M.D., Physician to the Winchester County Hospital; Winchester, Hants.

Elected

1866 Heath, Christopher, Assistant-Surgeon to, and Lecturer on Anatomy at, the Westminster Hospital; 9, Cavendish place.

1850 Heaton, George, M.D., Boston, U.S.

1829 †Heberden, Thomas, M.D., 43, Park street, Grosvenor square.

1844 Hennen, John, M.D. L. 1848-50.

1849 Henriques, Amos, M.D., Hon. Physician to the Spanish Embassy; 67, Upper Berkeley street, Portman square.

1821 Herberski, Vincent, M.D., Professor of Medicine in the University of Wilna.

1843 Hewett, Prescott Gardner, *Vice-President*, Surgeon to St. George's Hospital; 1, Chesterfield street, May fair. C. 1859. V.P. 1866. *Trans.* 7. *Sci. Com.*

1855 Hewitt, Graily, M.D., Professor of Midwifery in University College, London, and Obstetric Physician to University College Hospital; Physician to the British Lying-in Hospital; 36, Berkeley square.

1853 Hewlett, Thomas, Surgeon to Harrow School; Harrow, Middlesex. *Trans.* 1.

1862 Hill, Matthew Berkeley, M.B., Lond., Assistant-Surgeon to University College Hospital; 14, Weymouth street, Portland place.

1854 Hillier, Thomas, M.D., Physician to the Hospital for Sick Children; Physician to the Skin Department of University College Hospital; and Medical Officer of Health for St. Pancras; 32, Queen Anne street, Cavendish square. *Trans.* 1.

1842 Hillman, William Augustus, Senior Assistant-Surgeon to the Westminster Hospital; 1, Argyll street, Regent street. C. 1858-9.

1841 †Hilton, John, F.R.S., Surgeon to Guy's Hospital; Consulting Surgeon to the Royal General Dispensary, St. Pancras; 10, New Broad Street, City. C. 1851. V.P. 1863-4. *Trans.* 3.

1859 Hird, Francis, Assistant-Surgeon to, and Lecturer at, the Charing Cross Hospital; 13, Old Burlington street.

Elected

1813 Hodgson, Joseph, F.R.S., 60, Westbourne terrace, Hyde park gardens. C. 1817. P. 1851-2. *Trans.* 1

1861 *Hoffmeister, William Carter, M.D., Surgeon to H.M. the Queen in the Isle of Wight; Cowes, Isle of Wight.

1843 Holden, Luther, Surgeon to, and Lecturer on Anatomy at, St. Bartholomew's Hospital; Surgeon to the Metropolitan Dispensary; Surgeon to the Foundling Hospital; 65, Gower street, Bedford square. C. 1859. L. 1865.

1814 †Holland, Sir Henry, Bart., M.D., D.C.L., LL.D., F.R.S., Physician in Ordinary to H.M. the Queen; 25, Brook street, Grosvenor square. C. 1817, 1833-4. V.P. 1826, 1840. *Trans.* 1.

1861 Holman, William Henry, M.B. Lond., 68, Adelaide road south, Hampstead.

1856 Holmes, Timothy, Assistant-Surgeon to, and Lecturer on Anatomy at, St. George's Hospital, and Surgeon to the Hospital for Sick Children; Surgeon in Chief to the Metropolitan Police Force; 31, Clarges street, Piccadilly. *Trans.* 3.

1846 Holt, Barnard Wight, Senior Surgeon to, and Lecturer on Clinical Surgery at, the Westminster Hospital; Medical Officer of Health for Westminster; 14, Savile row, Burlington gardens. C. 1862-3.

1846 Holthouse, Carsten, Surgeon to, and Lecturer on Surgery at, the Westminster Hospital; Surgeon to the South London Ophthalmic Hospital; 2, Storey's gate, St. James's park. C. 1863.

1853 Hood, William Charles, M.D., F.L.S., Visiting Physician in Lunacy to the Court of Chancery; Croydon Lodge, Surrey. *Trans.* 1.

1865 Howard, Benjamin, M.D., 327, West 23rd street, New York.

1865 Howard, Edward, M.D., Redhill, Surrey.

1828 *Howell, Edward, M.D., Senior Consulting Physician to the Swansea Infirmary; 2, South Hill place, Swansea, Glamorganshire.

Elected

1857 Hulke, John Whitaker, Assistant-Surgeon to, and Lecturer on Physiology and Ophthalmic Surgery at, the Middlesex Hospital; Assistant-Surgeon to the Royal London Ophthalmic Hospital, Moorfields; 10, Old Burlington street. *Trans.* 4.

1857 Hulme, Edward Charles, Surgeon to the Great Northern Hospital; Surgeon to the Central London Ophthalmic Hospital; 38, Gower street, Bedford square. *Trans.* 1.

1844 Humby, Edwin, 83, Hamilton terrace, St. John's wood. C. 1866.

1855 Humphry, George Murray, M.D., F.R.S., Surgeon to Addenbrooke's Hospital, and Professor of Human Anatomy and Physiology in the Cambridge University Medical School; Cambridge. *Trans.* 4.

1866 Hunter, Charles, 30, Wilton place, Belgrave square.

1849 Hussey, Edward Law, Senior Surgeon to the Radcliffe Infirmary, and Consulting Surgeon to the County Lunatic Asylum and the Warneford Asylum; 104, St. Aldate's, Oxford. *Trans.* 1.

1856 Hutchinson, Jonathan, Surgeon to, and Lecturer on Surgery at, the London Hospital; Assistant-Surgeon to the Royal London Ophthalmic Hospital, Moorfields; Surgeon to the Metropolitan Free Hospital; 4, Finsbury circus. *Pro.* 2.

1820 Hutchinson, William, M.D.

1840 Hutton, Charles, M.D., Senior Physician to the General Lying-in Hospital; 26, Lowndes street, Belgrave square. C. 1858-9.

1866 Iles, Francis Henry Wilson, M.D., Watford, Herts.

1847 Image, William Edmund, Senior Surgeon to the Suffolk General Hospital; Bury St. Edmund's, Suffolk. *Trans.* 1.

1856 Inglis, Cornelius, M.D., 2, Norfolk rd., St. John's Wood.

1841 Jackson, Paul, 24, Wimpole street, Cavendish square. C. 1862.

1863 Jackson, Thomas Vincent, Surgeon to the South Staffordshire General Hospital; Darlington street, Wolverhampton.

Elected

1841 Jacobovics, Maximilien Morris, M.D., Vienna.

1825 James, John B., M.D.

1844 Jeaffreson, Samuel John, M.D., Physician to the Warneford Hospital, and Warwick Dispensary; Leamington, Warwickshire.

1839 Jeffreys, Julius, F.R.S., Drymona, Belvidere road south, Upper Norwood, Surrey.

1840 *Jenks, George Samuel, M.D., 18, Circus, Bath.

1851 Jenner, William, M.D., F.R.S., Physician in Ordinary to H.M. the Queen, and to H.R.H. the Prince of Wales; Physician to University College Hospital, and Professor of the Principles and Practice of Medicine in University College, London; 18, Harley street, Cavendish square. C. 1864. *Trans.* 3.

1848 Johnson, Athol Archibald Wood, 20, Regency square, Brighton. *Trans.* 1.

1851 Johnson, Edmund Charles, M.D., Corresponding Member of the Medical and Philosophical Society of Florence, and of "l'Institut Genevois."

1847 Johnson, George, M.D., Professor of the Principles and Practice of Medicine in King's College, London, and Physician to King's College Hospital; Member of the Senate of the University of London; 11, Savile row, Burlington gardens. C. 1862-3. *Trans.* 5.

1862 Jones, Charles Handfield, M.B., F.R.S., Physician to, and Lecturer on Medicine at, St. Mary's Hospital; 49, Green street, Grosvenor square.

1844 †Jones, Henry Bence, M.A., M.D., F.R.S., *Vice-President*, 31, Brook street, Grosvenor square. C. 1855-6. V.P. 1866. *Trans.* 11.

1835 †Jones, Henry Derviche, 12, Norfolk Crescent, Oxford square. C. 1854-5.

1837 Jones, Thomas William, M.D., 55, St. John's Park, Upper Holloway, and 3, North buildings, Finsbury.

1859 Jones, William Price, M.D., Surbiton, Kingston.

1865 Jordan, Furneaux, Surgeon to the Queen's Hospital, and Senior Surgeon to the Birmingham Eye and Ear Hospital; 16, Colmore row, Birmingham.

Elected

1829 *Julius, George Charles, Richmond, Surrey.

1816 *Kauffman, George Hermann, M.D., Hanover.

1848 *Kendell, Daniel Burton, M.D., Kettlethorpe Hall, Wakefield, Yorkshire.

1847 Keyser, Alfred, 21, Norfolk crescent, Oxford square.

1857 Kiallmark, Henry Walter, 66, Prince's sq., Bayswater.

1851 Kingdon, John Abernethy, Surgeon to the City of London Truss Society, and to the City Dispensary; 2, New Bank buildings, City. C. 1866. *Trans.* 1.

1855 Lane, James Robert, Surgeon to, and Lecturer on Operative Surgery at, St. Mary's Hospital, and Surgeon to the Lock and St. Mark's Hospitals; 2, Berkeley street, Piccadilly.

1840 Lane, Samuel Armstrong, Surgeon to, and Lecturer on Clinical Surgery at, St. Mary's Hospital, and Consulting Surgeon to the Lock Hospital; 2, Berkeley street, Piccadilly. C. 1849-50. V.P. 1865.

1865 Langton, John, Assistant Demonstrator at St. Bartholomew's Hospital; Assistant-Surgeon to the City of London Truss Society; the College, St. Bartholomew's Hospital.

1841 *Lashmar, Charles, M.D., 83, North End, Croydon, Surrey.

1862 Latham, Peter Wallwork, M.A., M.B., Physician to Addenbrooke's Hospital, Cambridge; Examiner for Medical Degrees in Cambridge University; 15, Sidney street, Cambridge.

1816 Lawrence, G.E.

1809 †Lawrence, William, F.R.S., Sergeant-Surgeon to H.M. the Queen; Consulting Surgeon to St. Bartholomew's Hospital; Surgeon to Bridewell and Bethlem Hospital; Foreign Associate of the Imperial Academy of Medicine of Paris; 18, Whitehall place. S. 1813-17. V.P. 1818-19. T. 1821-6. P. 1831-2. C. 1820, 1833-4, 1842-3. *Trans.* 18.

1840 Laycock, Thomas, M.D., F.R.S.E., Professor of the Practice of Medicine and of Clinical Medicine, and Lecturer on Psychology and Mental Diseases in the University of Edinburgh, and Physician to the Edinburgh Royal Infirmary; 4, Rutland street, Edinburgh.

Elected

1843 *Leach, Jesse, Moss Hall, Heywood, near Bury, Lancashire.

1822 Ledsam, John Joseph, M.D., 17, Esplanade, Scarborough, Yorkshire.

1823 †Lee, Henry, M.D., Weather Oak, Alvechurch, near Bromsgrove, Worcestershire. C. 1837. S. 1839-40.

1843 Lee, Henry, Surgeon to, and Lecturer on Pathology at, St. George's Hospital; 9, Savile row, Burlington gardens. C. 1856-7. L. 1863-4. *Trans.* 8. *Pro.* 1.

1822 †Lee, Robert, M.D., F.R.S., Corresponding Member of the Imperial Academy of Medicine, Paris; 4, Savile row, Burlington gardens. C. 1829, 1834. S. 1830-3. V.P. 1835. *Trans.* 27.

1836 Leighton, Frederick, M.D., Frankfort-on-the-Maine.

1854 Leon, Hananel de, M.D., 15, Holland villas road, North Kensington.

1806 Lind, John, M.D.

1819 Lloyd, Robert, M.D.

1820 Locher, J. G., M.C.D., Town Physician of Zurich. *Trans.* 2.

1824 †Locock, Sir Charles, Bart., M.D., F.R.S., First Physician-Accoucheur to H.M. the Queen; Member of the Senate of the University of London; 26, Hertford street, May fair. C. 1826. V.P. 1841. P. 1857-8. *Trans.* 1.

1852 Lodge, Charles, M.D., "United States Army."

1846 Lomax, Henry Thomas, Surgeon to the County Police; St. Mary's grove, Stafford.

1860 Longmore, Thomas, Deputy Inspector-General, and Professor of Clinical and Military Surgery, New Army Medical School, Royal Victoria Hospital, Netley, Southampton. *Trans.* 2.

1836 Löwenfeld, Joseph S., M.D. Berbice.

1852 Luke, James, F.R.S., Consulting Surgeon to the London Hospital, and Surgeon to St. Luke's Hospital for Lunatics; Woolley Lodge, Maidenhead Thicket, Berks. C. 1858. *Trans.* 4.

1857 Lyon, Felix William, M.D., Littlecote, Hungerford, Hants.

Elected

1862 *M'Donnell, Robert, M.D., F.R.S., Lecturer on Surgery in the Carmichael School of Medicine, and Surgeon to Jervis street Hospital; 14, Lower Pembroke street, Dublin. *Trans.* 1.

1846 M'Ewen, William, M.D., Surgeon to Chester Castle; 27, Nicholas street, Chester.

1866 Macgowan, Alexander Thorburn (late 52nd Foot), 5, Caversham road, Kentish town.

1823 †Macilwain, George, Consulting Surgeon to the Finsbury Dispensary, and the St. Anne's Society's Schools; 3, the Court yard, Albany. C. 1829-30. V.P. 1848. *Trans.* 1.

1822 Macintosh, Richard, M.D.

1859 *M'Intyre, John, M.D., Odiham, Hants.

1818 Mackenzie, William, M.D., Surgeon Oculist to H.M. the Queen in Scotland, and Surgeon to the Glasgow Eye Infirmary; 49, Bath street, Glasgow. *Trans.* 2.

1854 *Mackinder, Draper, M.D., Consulting Surgeon to the Dispensary, Gainsborough, Lincolnshire.

1844 Maclachlan, Daniel, M.D., late Physician to the Royal Hospital, Chelsea; Deputy Inspector-General of Hospitals; Ventnor, Isle of Wight. C. 1860-1. *Trans.* 1.

1860 Maclean, John, M.D., 24, Portman street, Portman square.

1849 Maclure, Duncan Maclachlan, M.B., 34, Harley street, Cavendish square.

1842 Macnaught, John, M.D., Bedford street, Liverpool.

1855 Marcet, William, M.D., F.R.S., 48, Harley street. *Trans.* 1. *Sci. Com.*

1848 Markham, William Orlando, M.D. Physician to St. Mary's Hospital; Poor Law Inspector for the Metropolitan District; 8, Harley street. C. 1862-3. *Trans.* 2.

1838 Marsh, Thomas Parr, M.D., Consulting Physician to the Salop Infirmary, Shrewsbury.

1851 Marshall, John, F.R.S., Professor of Surgery in University College, London, and Surgeon to University College Hospital; 10, Savile row, Burlington gardens. C. 1866. *Trans.* 2.

Elected

1841 Martin, Sir James Ranald, C.B., F.R.S., Examining Medical Officer to the Secretary of State for India in Council, President of Medical Board for Examination of Officers of H.M.'s Indian Medical Service; Inspector General of Hospitals; 37, Upper Brook street. C. 1853. V.P. 1862.

1853 Maspen, William Edward, Surgeon to the Staffordshire General Infirmary; Stafford.

1864 Mason, Francis, 10, Conduit street, Regent street.

1837 Mayo, Thomas, M.D., F.R.S., the Refuge, Yarmouth, Isle of Wight. S. 1841. C. 1847-8. V.P. 1851-2.

1839 Meade, Richard Henry, Senior Surgeon to the Bradford Infirmary; Bradford, Yorkshire. *Trans.* 1.

1865 Medwin, Aaron George, M.D., 4, Blackheath road, Kent.

1837 Merriman, Samuel William John, M.D., Consulting Physician-Accoucheur to the Westminster General Dispensary, 13, Godolphin road, New road, Hammersmith. C. 1851-2. *Trans.* 1.

1852 Merryweather, James, Consulting Surgeon to the National Dental Hospital; 57, Brook street, Grosvenor square.

1847 Meryon, Edward, M.D., F.G.S., 14, Clarges street, Piccadilly. L. 1859-60. C. 1864-5. *Trans.* 2.

1815 Meyer, Augustus, M.D., St. Petersburgh.

1840 Middlemore, Richard, Consulting Surgeon to the Birmingham Eye Infirmary; Temple row, Birmingham.

1854 Middleship, Edward Archibald, late of Richmond, Surrey.

1860 *Miles, Herbert Chalmers, Assistant-Surgeon in the Royal Artillery, Woolwich.

1818 *Miller, Patrick, M.D., F.R.S.E., Senior Physician to the Devon and Exeter Hospital, and to St. Thomas's Hospital for Lunatics; the Grove, Exeter, Devonshire.

1863 Monro, Henry, M.D., Physician to St. Luke's Hospital; 13, Cavendish square.

1844 Montefiore, Nathaniel, 36, Hyde park gardens.

Elected

1848 Moore, Charles Hewitt, *Vice President*, Surgeon to, and Lecturer on Anatomy at, the Middlesex Hospital; 102, Piccadilly. L. 1858. S. 1859-62. C. 1864-5. V.P. 1866. *Trans.* 8. *Sci. Com.*

1836 Moore, George, M.D., Hastings, Sussex.

1861 Morehead, Charles, M.D., Hon. Surgeon to H.M. the Queen; Deputy-Inspector General of Hospitals; 34, Melville street, Edinburgh.

1857 Morgan, John, 3, Sussex place, Hyde park gardens. *Trans.* 1.

1861 Morgan, John Edward, M.B., Lecturer on Pathology at the Manchester Royal School of Medicine; 3, Gore street, Piccadilly, Manchester.

1851 Mouat, Frederic John, M.D., Professor of Medicine in the Medical College of Calcutta, Secretary of the Council of Education in India, and Inspector-General of Gaols, Lower Provinces; Calcutta. (The Athenæum Club.)

1856 Murchison, Charles, M.D., F.R.S., Senior Physician to the London Fever Hospital; Physician to, and Lecturer on the Practice of Medicine at, the Middlesex Hospital; 79, Wimpole street, Cavendish square. *Trans.* 3.

1847 Murchison, Simon, Bicester, Oxon.

1863 Myers, Arthur, B. R., Coldstream Guards' Hospital, Vincent square, Westminster.

1859 Nayler, George, Assistant-Surgeon to the Hospital for Diseases of the Skin, Blackfriars; Assistant-Surgeon to the Royal Orthopædic Hospital; 8, George street, Hanover square.

1835 †Nelson, Thomas Andrew, M.D., 10, Nottingham terrace, York gate, Regent's park.

1843 Newton, Edward, 4, Upper Wimpole street. C. 1863-4.

1849 Norman, Henry Burford, Portland Lodge, Southsea, Hants.

1845 Norris, Henry, Charmouth, Dorset.

1847 *Nourse, William Edward Charles, 11, Marlborough place, Brighton.

1849 Noverre, Arthur, 25, South street, Park lane.

Elected

1864 Nunn, Thomas William, Surgeon to the Middlesex Hospital; 8, Stratford place, Oxford street.

1859 *Nunneley, Thomas, Senior Surgeon to the Leeds Eye and Ear Infirmary; Leeds. *Trans.* 3.

1847 O'Connor, Thomas, March, Cambridgeshire.

1843 O'Connor, William, M.D., Physician to the Royal Free Hospital; 30, Upper Montagu street, Montagu square.

1858 Ogle, John William, M.D., Physician to, and Lecturer on Pathology at, St. George's Hospital; 13, Upper Brook street, Grosvenor square. *Trans.* 4.

1855 *Ogle, William, M.A., M.D., Physician to the Derby Infirmary; 3, Stewart terrace, Derby.

1860 Ogle, William, M.D., Lecturer on Physiology at St. George's Hospital, and Physician to the St. George's and St. James's Dispensary; 34, Clarges street, Piccadilly.

1850 Oldham, Henry, M.D., Obstetric Physician to, and Clinical Lecturer on Midwifery at, Guy's Hospital; 26, Finsbury square. C. 1865. *Trans.* 1.

1846 *Ormerod, Edward Latham, M.D., Physician to the Sussex County Hospital; 14, Old Steine, Brighton. *Trans.* 2.

1847 *Page, William Bousfield, Surgeon to the Cumberland Infirmary; Carlisle. *Trans.* 2.

1840 †Paget, James, F.R.S., Surgeon Extraordinary to H.M. the Queen; Surgeon in Ordinary to H.R.H. the Prince of Wales; Surgeon to, and Lecturer on Surgery at, St. Bartholomew's Hospital, and Surgeon to Christ's Hospital; Member of the Senate of the University of London; 1, Harewood place, Hanover square. C. 1848-9. V.P. 1861. *Trans.* 8. *Sci. Com.*

1858 *Paley, William, M.D., Physician to the Ripon Dispensary; Ripon, Yorkshire.

1861 Palfrey, James, M.D., Assistant-Obstetric Physician to the London Hospital; Physician to the Metropolitan Free Hospital, and Obstetric Physician to the Farringdon General Dispensary and Lying-in Charity; 25, Finsbury place.

Elected

1836 Parker, Langston, Hon. Surgeon to the Queen's Hospital, Birmingham; Colmore row, Birmingham.

1847 Parker, Nicholas, M.D., 22, Finsbury square.

1841 Parkin, John, M.D., Rome.

1851 Part, James, M.D., 7, Camden road villas (89, Camden road), Camden town.

1828 †Partridge, Richard, F.R.S., Professor of Anatomy to the Royal Academy of Arts, Surgeon to King's College Hospital, and Professor of Anatomy in King's College, London; 17, New street, Spring gardens. S. 1832-6. C. 1837-8, 1861-2. V.P. 1847-8. P. 1863-4.

1865 Pavy, Frederick William, M.D., F.R.S., Assistant-Physician to, and Lecturer on Physiology and Comparative Anatomy at, Guy's Hospital; 35, Grosvenor street.

1845 Peacock, Thomas Bevill, M.D., Physician to, and Lecturer on Medicine at, St. Thomas's Hospital; Physician to the City of London Hospital for Diseases of the Chest, Victoria park; 20, Finsbury circus. S. 1855-6. *Trans.* 2.

1864 Pearson, David Ritchie, M.D., 23, Upper Phillimore place, Kensington.

1856 Peirce, Richard King, 16, Norland place, Notting hill.

1830 Pelechin, Charles P., M.D., St. Petersburgh.

1855 *Pemberton, Oliver, Surgeon to the Birmingham General Hospital, and Lecturer on Surgical Pathology at Sydenham College; 18, Temple row, Birmingham. *Trans.* 1.

1844 Pettigrew, William Vesalius, M.D., Surgeon to the Female Orphan Asylum; 7, Chester street, Grosvenor place.

1848 Phillips, Edward, M.D., F.L.S., Physician to the Coventry and Warwickshire Hospital; Coventry, Warwickshire.

1852 Phillips, Richard, 52, Leinster square, Westbourne grove.

1854 Phillips, Thomas Bacon, M.D., Physician to the Brighton and Hove Dispensary; 36, Lansdowne place, Brighton.

1846 Philp, Francis Richard, M.D., Colby House, Kensington, and Sherborne House, Harrogate, Yorkshire.

Elected

1851 *Pickford, James Hollins, M.D., M.R.I.A., 1, Cavendish place, Brighton.

1836 Pidduck, Isaac, M.D., Physician to the Bloomsbury Dispensary; 22, Montague street, Russell square. *Pro.* 2.

1841 Pitman, Henry Alfred, M.D., *Treasurer,* Consulting Physician to the Royal General Dispensary, St. Pancras; 94, Gloucester place, Portman square. L. 1851-3. C. 1861-2. T. 1863-6.

1850 Poland, Alfred, Surgeon to, and Lecturer on Surgery at, Guy's Hospital, and to the Eye Infirmary attached to the Hospital; 32, Trinity square, Southwark. C. 1865-6.

1845 Pollock, George David, Surgeon in Ordinary to H.R.H. the Prince of Wales; Surgeon to St. George's Hospital; 27, Grosvenor street. C. 1856-7. L. 1859-62. *Trans.* 2.

1865 Pollock, James Edward, M.D., Physician to the Hospital for Consumption, Brompton; 52, Upper Brook street, Grosvenor square.

1843 Pope, Charles, M.D., Glastonbury, Somersetshire.

1846 Potter, Jephson, M.D., F.L.S., Physician to the Liverpool General Hospital for Consumption and Diseases of the Chest; 109, Upper Parliament Street, Liverpool.

1842 Powell, James, M.D.

1851 Power, Robert Francis, M.D., 71, Gloucester place, Portman square.

1857 Priestley, William Overend, M.D., Physician-Accoucheur to H.R.H. the Princess Louis of Hesse; Professor of Midwifery in King's College, London; and Physician for the Diseases of Women and Children to King's College Hospital; Examiner in Midwifery at the University of London; Consulting Physician-Accoucheur to the St. Marylebone Infirmary; 17, Hertford street, May fair. *Sci. Com.*

1839 Propert, John, Consulting Surgeon to the Society of Ancient Britons; 6, New Cavendish street, Portland place.

1845 Pyle, John, 59, Oxford terrace, Hyde park. C. 1860.

Elected

1850 Quain, Richard, M.D., Physician to the Hospital for Consumption and Diseases of the Chest; Member of the Senate of the University of London; 67, Harley street, Cavendish square. C. 1866. *Trans.* 1. *Sci. Com.*

1835 †Quain, Richard, F.R.S., Surgeon Extraordinary to H.M. the Queen; Emeritus Professor of Clinical Surgery, University College, London; Consulting Surgeon to the Eye Infirmary attached to the Hospital; 32, Cavendish square. C. 1838-9. L. 1846-8. T. 1851-3. V.P. 1856-7. *Trans.* 1. *Pro.* 2.

1852 Radcliffe, Charles Bland, M.D., Physician to, and Lecturer on Materia Medica at, the Westminster Hospital; Physician to the National Hospital for the Paralysed and Epileptic; 25, Cavendish square.

1857 Ranke, Henry, M.D., Munich.

1854 Ransom, William Henry, M.D., Physician to the Nottingham General Hospital; the Pavement, Nottingham.

1859 Raymond, Henry Hunter, Cirencester, Gloucestershire.

1858 Reed, Frederick George, M.D., 46, Hertford street, May fair. *Trans.* 1.

1821 Reeder, Henry, M.D.

1857 Rees, George Owen, M.D., F.R.S., Physician to, and Lecturer on Medicine at, Guy's Hospital; 26, Albemarle street, Piccadilly. *Trans.* 1.

1855 Reynolds, John Russell, M.D., Professor of Clinical Medicine in University College, London, and Physician to University College Hospital; Physician to the National Hospital for the Paralysed and Epileptic; 38, Grosvenor street.

1865 Rhodes, George Winter, Surgeon to the Huddersfield Infirmary; 30, Ramsden street, Huddersfield.

1847 Richards, Samuel, M.D., 36, Bedford square.

1852 Richardson, Christopher Thomas, M.B., Warcop, Penrith.

1849 *Richardson, William, M.D., 9, Ephraim road, Tunbridge Wells, Kent.

1845 Ridge, Benjamin, M.D., 21, Bruton street, Berkeley square.

1843 Ridge, Joseph, M.D., 39, Dorset square. C. 1858. *Pro.* 1.

Elected

1852 Ridley, Charles, Surgeon to the Royal Society for Protection of Life from Fire; 6, Charlotte street, Bedford square.

1863 Ringer, Sydney, M.D., Professor of Materia Medica in University College, London, and Physician to University College Hospital; Assistant-Physician to the Hospital for Sick Children; 15, Cavendish place.

1852 Roberts, John, M.R.C.P., 56, Grosvenor Street.

1855 Robertson, Charles Alexander Lockhart, M.D., Medical Superintendent of the Sussex County Lunatic Asylum; Hayward's Heath, Sussex.

1857 Robertson, John Charles George, Assistant Medical Officer, Female Department, Middlesex County Lunatic Asylum, Hanwell.

1862 Robinson, Charles, F.R.C.P. Edinb., 11, Montagu street, Portman square.

1843 Robinson, George, M.D. *Trans.* 2.

1843 Roden, William, M.D., the Grange, Kidderminster, Worcestershire.

1835 †Roe, George Hamilton, M.D., Senior Physician to the Hospital for Consumption and Diseases of the Chest; 57, Park street, Grosvenor square. C. 1841-2. *Trans.* 1.

1836 Rogers, Arnold, Consulting Surgeon-Dentist to St. Bartholomew's Hospital; 16, Hanover square.

1829 Roots, William Sudlow, F.L.S., Surgeon to the Royal Establishment at Hampton Court; Kingston, Surrey.

1850 Roper, George, 180, Shoreditch.

1855 Roscow, Thomas Tattersall, M.D.

1836 *Rose, Caleb Burrell, F.G.S., 25, King street, Great Yarmouth, Norfolk. *Trans.* 1.

1857 Rose, Henry Cooper, M.D., Surgeon to the Hampstead Dispensary, High street, Hampstead.

1849 Routh, Charles Henry Felix, M.D., Physician to the Samaritan Free Hospital for Women and Children; 52, Montagu square. *Trans.* 1.

1863 Rowe, Thomas Smith, M.D., Surgeon to the Royal Seabathing Infirmary; Cecil street, Margate, Kent.

1834 Rumsey, Henry Wyldbore, Wolseley house, Cheltenham.

Elected

1845 Russell, James, M.D., Physician to the Birmingham General Hospital, and Lecturer on Pathology and Therapeutics at Sydenham College; 91, New Hall street, Birmingham.

1851 Salter, Henry Hyde, M.D., F.R.S., *Secretary*, Physician to, and Lecturer on Medicine at, the Charing Cross Hospital; 14, Harley street, Cavendish square. S. 1866. *Sci. Com.*

1856 Salter, Samuel James A., F.R.S., F.L.S., Surgeon-Dentist to, and Lecturer on Dental Surgery at, Guy's Hospital; 17, New Broad street, City. *Trans.* 2.

1849 Sanderson, Hugh James, M.D., Physician to the Hospital for Women; 26, Upper Berkeley street, Portman square.

1855 Sanderson, John Burdon, M.D., Assistant-Physician to, and Lecturer on Physiology at, the Middlesex Hospital; Medical Officer of Health for Paddington; 49, Queen Anne street, Cavendish square. *Trans.* 1. *Sci. Com.*

1847 Sankey, William Henry Octavius, M.D., Lecturer on Mental Diseases at University College, London; Sandywell park, near Cheltenham.

1845 Saunders, Edwin, Surgeon-Dentist to H.M. the Queen, and to H.R.H. the Prince of Wales; 13a, George street, Hanover square.

1834 Sauvan, Ludwig V., M.D., Warsaw.

1859 Savory, William Scovell, F.R.S., Assistant-Surgeon to, and Lecturer on General Anatomy and Physiology at, St. Bartholomew's Hospital; Examiner in Physiology and Comparative Anatomy at the University of London; 23a, Brook street, Grosvenor square. *Trans.* 3. *Sci. Com.*

1853 Schulhof, Maurice, M.D., Physician to the Royal General Dispensary, Bartholomew Close; 14, Brook street, Grosvenor square.

1861 *Scott, William, M.D., Physician to the Huddersfield Infirmary; 12, New North road, Huddersfield.

1858 *Scratchley, George, M.D., New Orleans, Louisiana, U.S.

Elected

1863 SEDGWICK, WILLIAM, Surgeon to the St. Marylebone Provident Dispensary; 12, Park place, Upper Baker Street.

1856 SERCOMBE, EDWIN, Surgeon-Dentist to St. Mary's Hospital; 49, Brook street, Grosvenor square. *Trans.* 1. *Pro.* 1.

1840 SHARP, WILLIAM, M.D., F.R.S., Horton House, Rugby. *Trans.* 1.

1837 †SHARPEY, WILLIAM, M.D., F.R.S., LL.D., Professor of Anatomy and Physiology in University College, London; Member of the Senate of the University of London, and Secretary of the Royal Society; 33, Woburn place, Russell square. C. 1848-9. V.P. 1862.

1836 †SHAW, ALEXANDER, Surgeon to, and Lecturer on Surgery at, the Middlesex Hospital; 40, Abbey road west, Kilburn. C. 1842. S. 1843-4. V.P. 1851-2. T. 1858-60. *Trans.* 4.

1848 *SHEARMAN, EDWARD JAMES, M.D., Moorgate, Rotherham, Yorkshire.

1859 SIBLEY, SEPTIMUS WILLIAM, Lecturer on Pathological Anatomy at the Middlesex Hospital; 12, New Burlington street. *Trans* 4. *Sci. Com.*

1849 SIBSON, FRANCIS, M.D., F.R.S., Physician to St. Mary's Hospital; Member of the Senate of the University of London; 40, Brook street, Grosvenor square. C. 1863-4. *Trans.* 1. *Sci. Com.*

1848 SIEVEKING, EDWARD HENRY, M.D., Physician in Ordinary to H.R.H. the Prince of Wales; Physician to, and Lecturer on Materia Medica at, St. Mary's Hospital; Physician to the National Hospital for the Paralysed and Epileptic; 17, Manchester square. C. 1859-60. S. 1861-3. *Trans.* 2. *Sci. Com.*

1842 SIMON, JOHN, F.R.S., Surgeon to, and Lecturer on General Pathology at, St. Thomas's Hospital; Medical Officer of the Privy Council; 8, Richmond terrace, Whitehall. C. 1854-55. V.P. 1865. *Trans.* 1.

1865 SIMS, J. MARION, M.D., Paris.

1857 SIORDET, JAMES LEWIS, M.B., Mentone.

1827 SKENE, GEORGE ROBERT, Bedford.

Elected

1824 †Skey, Frederic Carpenter, F.R.S., Consulting Surgeon to, and Lecturer on Clinical Surgery at, St. Bartholomew's Hospital; 24, Mount street, Grosvenor square. C. 1828. L. 1829-31. V.P. 1841-2. P. 1859-60. *Trans.* 1.

1852 Smith, Charles Case, Consulting Surgeon to the Suffolk General Hospital; Bury St. Edmund's, Suffolk.

1866 Smith, Heywood, M.B. Oxon., 25, Park street, Grosvenor square.

1835 Smith, John Gregory, Harewood, Leeds, Yorkshire.

1843 Smith, Robert William, M.D., M.R.I.A., Professor of Surgery in the University of Dublin; Surgeon to the Richmond Hospital; 63, Eccles street, Dublin.

1838 Smith, Spencer, Surgeon to, and Lecturer on Surgery at, St. Mary's Hospital; 9, Queen Anne street, Cavendish square. C. 1854. S. 1855-8. V.P. 1859-60. T. 1865.

1863 Smith, Thomas, Assistant-Surgeon to, and Demonstrator of Anatomy at, St. Bartholomew's Hospital, and Assistant-Surgeon to the Hospital for Sick Children; 7, Montague street, Russell square. *Trans.* 1.

1864 *Smith, Thomas Heckstall, Rowlands, St. Mary Cray, Kent.

1845 Smith, William, 1, Atlantic terrace west, Weston-super-Mare. *Trans.* 1.

1847 Smith, William, M.D., Consulting Physician to the Weymouth Infirmary; Weymouth, Dorsetshire.

1850 Smith, William Tyler, M.D., Physician-Accoucheur to, and Lecturer on Midwifery at, St. Mary's Hospital; 21, Upper Grosvenor street. *Trans.* 2.

1851 Soden, John, see *Corbet*.

1830 †Solly, Samuel, F.R.S., Senior Surgeon to, and Lecturer on Surgery at, St. Thomas's Hospital; Consulting Surgeon to the Royal General Dispensary, Bartholomew Close; 6, Savile row. L. 1838-40. C. 1845-6. V.P. 1849-50. *Trans.* 6.

Elected

1865 SOUTHAM, GEORGE, Surgeon to the Manchester Royal Infirmary; 21, Lever street, and Oakfield, Pendleton, Manchester. *Trans.* 4.

1865 SOUTHEY, REGINALD, M.B., Assistant-Physician to St. Bartholomew's Hospital; Physician to the Royal General Dispensary; 32, Montague place, Russell square.

1844 SPACKMAN, FREDERICK R., M.D., Harpenden, St. Albans.

1834 SPARK, JAMES, Italy

1851 SPITTA, ROBERT JOHN, M.B., Medical Officer to the Clapham General Dispensary; Clapham, Surrey. *Trans.* 1.

1843 *SPRANGER, STEPHEN, Hursley, Hampshire.

1857 STANTON, JOHN, M.D., 9, Montagu square.

1851 STARTIN, JAMES, Surgeon to, and Lecturer on Cutaneous Disorders at, the Hospital for Diseases of the Skin, Blackfriars; 3, Savile row, Burlington gardens.

1854 STEVENS, HENRY, M.D. Lond., 79, Grosvenor street.

1842 STEWART, ALEXANDER PATRICK, M.D., *Librarian;* 75, Grosvenor street. C. 1856-7. L. 1863-6.

1859 STEWART, WILLIAM EDWARD, 12, Weymouth street, Portland place.

1856 STOCKER, ALONZO HENRY, M.D., Resident Medical Superintendent of Grove Hall Lunatic Asylum, Bow.

1865 STOKES, WILLIAM, Jun., M.D., 5, Merrion square north, Dublin.

1843 STORKS, ROBERT REEVE, Paris.

1858 †STREATFEILD, JOHN FREMLYN, Assistant-Surgeon to the Royal London Ophthalmic Hospital, Moorfields, and Assistant-Surgeon to the Eye Infirmary attached to University College Hospital; 15, Upper Brook street, Grosvenor square.

1863 STURGES, OCTAVIUS, M.B., Physician to the Chelsea, Brompton, and Belgrave Dispensary; 85, Wimpole street.

1839 SUTHERLAND, ALEXANDER JOHN, M.D., F.R.S., Consulting Physician to the Royal South London Dispensary; 6, Richmond terrace, Whitehall. C. 1850-1. V.P. 1858-9. *Trans.* 1.

Elected

1860 Sutro, Sigismund, M.D., Senior Physician to the German Hospital; 37a, Finsbury square.

1855 Sutton, John Maule, M.D., Bloomfield, Narberth, Pembrokeshire.

1861 *Sweeting, George Bacon, King's Lynn, Norfolk.

1842 Syme, James, F.R.S.E., Surgeon in Ordinary to H.M. the Queen in Scotland; Professor of Clinical Surgery in the University of Edinburgh, and Surgeon to the Edinburgh Royal Infirmary; 2, Rutland street, Edinburgh. *Trans.* 5.

1854 *Symonds, Frederick, Surgeon to the Radcliffe Infirmary, and Consulting Surgeon to the Oxford Dispensary; 35, Beaumont street, Oxford.

1844 Tamplin, Richard William, Surgeon to the Royal Orthopædic Hospital; 33, Old Burlington street.

1848 Tanner, Thomas Hawkes, M.D., F.L.S., 9, Henrietta street, Cavendish square.

1864 Taussig, Gabriel, M.D., 70, Piazza Barberini, Rome.

1852 Taylor, Robert, Surgeon to the Central London Ophthalmic Hospital, and to the Cripple's Home, Hill street; 21, Edwards street, Portman square.

1845 Taylor, Thomas, Lecturer on Chemistry at the Middlesex Hospital Medical School; 4, Vere street, Cavendish sq.

1856 Teale, Thomas Pridgin, F.R.S., F.L.S., Surgeon to the Leeds General Infirmary; Albion st., Leeds. *Trans.* 2.

1859 Tegart, Edward, 49, Jermyn street, St. James's.

1862 Thompson, Edmund Symes, M.D., Assistant-Physician to King's College Hospital, and to the Hospital for Consumption, Brompton; 3, Upper George street, Portman square.

1857 Thompson, Henry, M.D., Physician to, and Lecturer on Materia Medica at, the Middlesex Hospital; 52, Welbeck street, Cavendish square.

1852 Thompson, Henry, Surgeon Extraordinary to H.M. the King of the Belgians, Surgeon to University College Hospital, and Consulting Surgeon to the St. Marylebone Infirmary; 35, Wimpole street, Cavendish square. *Trans.* 3.

Elected

1862 THOMPSON, REGINALD EDWARD, M.D., Physician to the St. George's and St. James's Dispensary; 21, South street, Park lane.

1836 THURNAM, JOHN, M.D., Resident Medical Superintendent of the Wilts County Asylum, Devizes, Wiltshire. *Trans.* 4.

1848 TILT, EDWARD JOHN, M.D., Consulting Physician to the Farringdon General Dispensary and Lying-in Charity; 60, Grosvenor street.

1828 TORRIE, JAMES, M.D., Old Bridge of Don, by Aberdeen.

1850 TRACY, SAMUEL JOHN, Surgeon-Dentist to St. Bartholomew's and Christ's Hospitals; 28, Old Burlington street.

1859 TRUMAN, EDWIN THOMAS, Surgeon-Dentist in Ordinary to Her Majesty's Household; 23, Old Burlington street.

1864 TUFNELL, THOMAS JOLLIFFE, Examiner in Surgery to the Royal College of Surgeons of Ireland; 58, Lower Mount street, Merrion square, Dublin.

1862 TUKE, THOMAS HARRINGTON, M.D., Manor House, Chiswick, and 37, Albemarle street.

1855 TULLOCH, JAMES STEWART, M.D., 1, Pembridge place, Bayswater.

1864 TURNER, GEORGE, 9, Sussex gardens, Hyde park.

1845 TURNER, THOMAS, F.L.S., Consulting Surgeon to the Manchester Royal Infirmary, and Lecturer on Anatomy and Physiology at the Manchester Royal School of Medicine; 77, Mosley street, Manchester.

1806 VAUX, BOWYER, Teignmouth, Devon.

1865 VERNON, BOWATER JOHN, Assistant-Demonstrator of Anatomy, St. Bartholomew's Hospital.

1828 VULPES, BENEDETTO, M.D., Physician to the Hospital of Aversa, and the Hospital of Incurables, Naples.

1854 WADDINGTON, EDWARD, Kettlethorpe Hall, Newark, Notts.

1841 WADE, ROBERT, Senior Surgeon to the Westminster General Dispensary; 68, Dean street, Soho. *Trans.* 1.

1864 WAITE, CHARLES DERBY, M.B., 3, Old Burlington street.

1861 *WALSH, JAMES, M.D., Staff-Surgeon, R.N., 41, Catharine street, Limerick, Ireland.

Elected

1852 Walshe, Walter Hayle, M.D., Emeritus Professor of the Principles and Practice of Medicine, University College, London; Consulting Physician to the Hospital for Consumption; 37, Queen Anne st., Cavendish sq. *Trans.* 1.

1851 Walton, Henry Haynes, Surgeon to the Central London Ophthalmic Hospital, and Surgeon to St. Mary's Hospital; 69, Brook street, Hanover sq. *Trans.* 1. *Pro.* 1.

1852 Wane, Daniel, M.D., 20, Grafton street, Berkeley square.

1821 Ward, William Tilleard.

1858 Wardell, John Richard, M.D., 4, Belmont, Tunbridge Wells.

1846 Ware, James Thomas, Consulting Surgeon to the Finsbury Dispensary, and Hon. Surgeon to the Metropolitan Convalescent Institution; 18, Gordon square.

1818 Ware, John, Clifton Down, near Bristol.

1814 †Ware, Martin, 18, Gordon square. C. 1844-5. T. 1846. V.P. 1853.

1829 Warry, Elias Taylor, M.D., Yeovil, Somerset.

1861 Waters, A. T. Houghton, M.D., Physician to the Liverpool Northern Hospital, and Lecturer on Anatomy and Physiology in the Liverpool Royal Infirmary School of Medicine; 27, Hope street, Liverpool. *Trans.* 3.

1837 Watson, Sir Thomas, Bart., M.D., D.C.L., F.R.S., President of the Royal College of Physicians; Physician Extraordinary to H.M. the Queen; Consulting Physician to King's College Hospital; 16, Henrietta street, Cavendish square. C. 1840-1, 1852. V.P. 1845-6.

1861 Watson, William Spencer, M.B., Assistant-Surgeon to King's College Hospital; 27, Montague street, Russell square.

1854 Webb, William, M.D., Wirksworth, Derbyshire.

1840 Webb, William Woodham, M.D., Cliff House, Kirtley, South Lowestoft, Suffolk.

1842 Weber, Frederic, M.D., 44, Green street, Park lane. C. 1857. V.P. 1865.

1857 Weber, Hermann, M.D., Physician to the German Hospital; 49, Finsbury square. *Trans.* 5.

Elected

1835 †Webster, John, M.D., F.R.S., Physician to the Scottish Hospital, and Consulting Physician to the St. George's and St. James's Dispensary. C. 1843-4. V.P. 1855-6. *Trans.* 6. *Pro.* 1.

1844 Wegg, William, M.D., Physician to the St. George's and St. James's Dispensary; 26, Park lane. L. 1854-8. C. 1861-2.

1861 Wells, John Soelberg, Professor of Ophthalmology in King's College, London, and Ophthalmic Surgeon to King's College Hospital; 16, Savile row.

1854 Wells, Thomas Spencer, Surgeon in Ordinary to H.M.'s Household; Surgeon to the Samaritan Free Hospital for Women and Children; 3, Upper Grosvenor street. *Trans.* 4. *Pro.* 1.

1842 †West, Charles, M.D., Physician to the Hospital for Sick Children; 61, Wimpole street, Cavendish square. C. 1855-6. V.P. 1863. *Trans.* 2. *Sci. Com.*

1828 Whatley, John, M.D.

1849 White, John.

1852 Wiblin, John, M.D., Medical Inspector of Emigrants and Recruits; Southampton. *Trans.* 1.

1844 Wildbore, Frederic, 1, Trafalgar place east, [245] Hackney road.

1837 Wilks, George Augustus Frederick, M.D., [5, Lincoln's Inn Fields.]

1863 Wilks, Samuel, M.D., Assistant-Physician to, and Lecturer on Medicine at, Guy's Hospital, Examiner in Medicine at the University of London; 11, St. Thomas's street, Southwark.

1865 Willett, Alfred, Assistant-Surgeon to, and Warden of the College, St. Bartholomew's Hospital; the College, St. Bartholomew's Hospital.

1864 Willett, Edmund Sparshall, M.D., Resident Physician, Wyke House, Isleworth, Middlesex.

1860 Williams, Arthur Wynn, M.D., Physician-Accoucheur to the Western General Dispensary; 1, Montagu square.

Elected

1840 Williams, Charles James Blasius, M.D., F.R.S., Consulting Physician to the Hospital for Consumption ; 49, Upper Brook street, Grosvenor square. C. 1849-50. V.P. 1860-1. *Sci. Com.*

1859 *Williams, Charles, Surgeon to the Norwich Dispensary ; 9, Prince of Wales road, Norwich.

1866 Williams, Charles Theodore, M.B. Oxon. ; 49, Upper Brook street, Grosvenor square.

1859 Williams, Joseph, M.D., 8, Tavistock square.

1829 Willis, Robert, M.D., Barnes, Surrey. L. 1838-41.

1839 †Wilson, Erasmus, F.R.S., Consulting Surgeon to the St. Pancras Infirmary; 17, Henrietta street, Cavendish square. *Trans.* 2.

1863 Wilson, Robert James, L.R.C.P. Edinb., 24, Grand Parade, St. Leonards-on-Sea, Sussex.

1850 *Wise, Robert Stanton, M.D., Consulting Physician to the Southam Eye and Ear Infirmary: Banbury, Oxfordshire.

1825 Wise, Thomas Alexander, M.D., Rostellan Castle, Rostellan, County Cork.

1841 Wood, George Leighton, Surgeon to the Bath General Hospital ; 27, Queen square, Bath.

1851 Wood, John, Assistant-Surgeon to King's College Hospital, and Demonstrator of Anatomy in King's College, London ; 4, Montague street, Russell square. *Trans.* 2.

1848 Wood, William, M.D., Physician to St. Luke's Hospital for Lunatics ; 54, Upper Harley street.

1843 Woodfall, John Ward, M.D., Physician to the West Kent Infirmary ; Maidstone, Kent.

1833 †Wormald, Thomas, Surgeon to St. Bartholomew's Hospital; 42, Bedford Row. C. 1839. V.P. 1854.

1842 Worthington, William Collins, Senior Surgeon to the Lowestoft Infirmary ; Lowestoft, Suffolk. *Trans.* 3.

1865 Wotton, Henry, Jun., 106, Gloucester place, Portman square.

1848 Wright, Edward John, 13, Montague place, Clapham road.

Elected

1855 WRIGHT, HENRY G., M.D., Physician to the Samaritan Free Hospital for Women and Children; 23, Somerset street, Portman Square.

1860 WYATT, JOHN, Surgeon-Major, Coldstream Guards; Hospital, Vincent square, Westminster.

[It is particularly requested, that any change of Title, Appointment, or Residence, may be communicated to the Secretaries before the 1st of October in each year, in order that the List may be made as correct as possible.]

HONORARY FELLOWS.

(Limited to Twelve.)

Elected

1835 Brewster, Sir David, K.H., D.C.L., LL.D., F.R.S., Corresp. Memb. Institute of France, Principal and Vice-Chancellor of the University of Edinburgh.

1853 Brodie, Sir Benjamin Collins, Bart., M.A., F.R.S., Waynflete Professor of Chemistry at Oxford; Cowley House, Oxford.

1847 Chadwick, Edwin, late Commissioner of the Board of Health.

1862 Daubeny, Charles Giles Bridle, M.D., LL.D., F.R.S., Hon. M.R.I.A., &c., Professor of Botany, Oxford.

1835 Faraday, Michael, D.C.L., F.R.S., Corresp. Memb. Institute of France, Member of the Senate of the University of London, and Fullerian Professor of Chemistry in the Royal Institution.

1857 Farr, William, M.D., D.C.L., F.R.S., General Register Office, Somerset House, and Southlands, Bromley, Kent.

1841 Herschel, Sir John Frederick William, Bart., D.C.L., F.R.S., Corresp. Memb. Institute of France; Collingwood, near Hawkhurst, Kent.

1866 Murchison, Sir Roderick Impey, Bart., K.C.B., D.C.L. Oxon., LL.D. Camb., M.A., F.R.S., Director-General of the Geological Survey; 16, Belgrave Square.

1847 Owen, Richard, D.C.L., LL.D., F.R.S., Corresp. Memb. Institute of France (Foreign Associate of the Academy of Sciences), Superintendent of the Natural History Departments in the British Museum; Sheen Lodge, Mortlake.

1825 Sedgwick, The Rev. Adam, A.M., D.C.L., LL.D., F.R.S., Woodwardian Professor of Geology, Cambridge.

FOREIGN HONORARY FELLOWS.

(Limited to Twenty.)

Elected

1841 Andral, G., M.D., Member of the Institute and of the Imperial Academy of Medicine, Physician in Ordinary to the Emperor of the French; Paris.

1862 Cruveilhier, Jean, M.D., Physician to the "Hôpital de la Charité," Professor of Pathological Anatomy to the Faculty of Medicine, Member of the Imperial Academy of Medicine, &c.; Paris.

1864 Donders, F. C., M.D., Professor of Physiology and Ophthalmology at the University of Utrecht.

1856 Dubois, Baron Paul, Commander of the Legion of Honour, Member of the Imperial Academy of Medicine, late Dean of the Faculty of Medicine; Paris.

1835 Ekströmer, Carl Johan, M.D., C.M., K.P.S., and W., Physician to the King of Sweden, President of the College of Health, and Director-General of Hospitals; Stockholm.

1841 Ehrenberg, Christian Gottfried, Member of the Institute of France; Berlin.

1866 Hannover, Adolph, M.D., Professor at Copenhagen.

1859 Henle, J., M.D., Professor of Anatomy at Göttingen.

1841 Jackson, James, M.D., LL.D., Emeritus Professor of Medicine, Harvard University, Boston, U.S.

1856 Langenbeck, Bernhard, M.D., Professor of Surgery in the University of Berlin.

1843 Liebig, Baron Justus von, M.D., Foreign Associate of the Academy of Sciences, Conservator of the Royal Collection, and Professor of Chemistry in the University of Munich.

1841 Louis, P. C. A., M.D., Honorary Physician to the Hôtel-Dieu, Member of the Imperial Academy of Medicine; Paris.

Elected

1847 Matteucci, Carlo, Professor in the University of Pisa, Member of the Institute of France, Minister of Public Instruction in Italy.

1841 Panizza, Bartolomeo, M.D.; Pavia.

1862 Pirogoff, Nikolaus, M.D., Professor of Surgery to the Medico-Chirurgical Academy in St. Petersburg, Director of the Anatomical Institute, Consulting Physician to the Hospitals Obuchow, Peter-Paul, and Maria Magdalena; St. Petersburg.

1859 Rayer, Pierre, M.D., Grand Officer of the Legion of Honour, Member of the Institute, and of the Imperial Academy of Medicine; Paris.

1850 Rokitansky, Carl, M.D., Curator of the Imperial Pathological Museum, and Professor of the University of Vienna. Referee for Medical and University Education to the Austrian Ministry.

1856 Stromeyer, Louis, M.D., Director-General of the Medical Department of the Army of Hanover; Hanover.

1856 Velpeau, A., Member of the Institute, and of the Imperial Academy of Medicine, Professor in the Faculty of Medicine, Surgeon to the "Hôpital de la Charité," President of the Academy of Sciences; Paris.

1856 Virchow, Rudolph, M.D., Professor of Pathological Anatomy in the University of Berlin.

CONTENTS.

	PAGE
List of Officers and Council	v
List of Referees	vii
List of Presidents of the Society	viii
List of Fellows of the Society	ix
List of Honorary ditto	li

I. Observations on the Effect of Coffee on the Urea and Chlorides in Health. By CHARLES E. SQUAREY, M.R.C.S., Resident Medical Officer to the London Fever Hospital. (Communicated by A. B. Garrod, M.D., F.R.S.) 1

II. Case in which the operation of Trephining of the Spine was performed. By SAMUEL GORDON, M.B., Physician to the Richmond, Whitworth, and Hardwicke Hospitals. (Communicated, with observations, by Robert Macdonnell, M.D., F.R.S., Surgeon to Jervis Street Hospital, Dublin.) . . . 21

III. Account of an Arterio-venous Cyst in the Popliteal Nerve, for which the limb was amputated. By CHARLES H. MOORE. F.R.C.S., Vice-President of the Society 29

IV. Case of Multiple Neuromata affecting the nerves both within and external to the spinal canal, some of the tumours being of a cystic nature. By SEPTIMUS W. SIBLEY, F.R.C.S., Lecturer on Pathological Anatomy at the Middlesex Hospital. (With a Plate.) . 39

V. On Granular Degeneration of the Voluntary Muscles. By EDWARD MERYON, M.D., F.R.C.S. (With a Plate.) 45

PAGE

VI. Notes and Observations on Fever during service on board H.M.'s screw corvette Pylades of 21 guns, on the west coast of Mexico, in 1860. By JOHN CADDY, M.D., Surgeon R.N. (Communicated by the late Thomas Hodgkin, M.D.) 51

VII. Case of Lumbar Colotomy (Amussat's operation) successfully performed for the relief of a vesico-intestinal fistula. By T. HOLMES, M.A. Cant., F.R.C.S., Surgeon to the Hospital for Sick Children and Assistant-Surgeon to St. George's Hospital 65

VIII. On a Case of Hydatid Disease of the Liver, and remarks on the treatment of similar tumours. By JOHN HARLEY, M.D. Lond., F.L.S., Assistant-Physician to King's College Hospital 79

IX. Pathological and Surgical Observations on the Diseases of the Ear (Eighth Series): on Disconnection of the Incus and the Stapes, its effects upon the function of hearing and its treatment. By the late JOSEPH TOYNBEE, F.R.S., F.R.C.S., Consulting Aural Surgeon to St. Mary's Hospital 147

X. Case of Premature Menstruation. By THOMAS CLIFFORD ALLBUTT, B.A., M.B., Cant., Physician to the Leeds General Infirmary, &c. 161

XI. Case of Myeloid Transformation of the Lungs. By THOMAS CLIFFORD ALLBUTT, B.A., M.B., Cant. . 165

XII. On Atrophy or Degeneration of the Muscles of the Upper and Lower Extremities from Disease of the Spinal Cord. By GEORGE LEWIS COOPER, F.R.C.S., Surgeon to the Bloomsbury Dispensary. [With examination of the spinal cord by Mr. LOCKHART CLARKE.] (With a Plate.) 171

XIII. On a case of Elephantiasis Arabum, or Elephas, successfully treated by the application of a ligature to the main artery of the limb, with remarks. By THOMAS BRYANT, F.R.C.S., Assistant-Surgeon to Guy's Hospital. (With two Plates.) 175

PAGE

XIV. Account of a Case of Oblique Inguinal Hernia on each side, in which, the testis remaining in the belly, the hernial sacs descended into the scrotum and also ascended upon the aponeurosis of the external oblique muscles. By J. W. Hulke, F.R.C.S., Assistant-Surgeon to the Middlesex Hospital, and to the Royal London Ophthalmic Hospital . . . 189

XV. Account of a second Case in which the Corpus Callosum was defective. By J. Langdon H. Down, M.D. Lond., Assistant-Physician to, and Lecturer on Materia Medica at, the London Hospital; Physician to the Asylum for Idiots, Earlswood . . 195

XVI. Remarks on Chronic Albuminuria originating during the convalescence from Scarlet Fever and other Eruptive Diseases. By Hermann Weber, M.D., F.R.C.P., Physician to the German Hospital . . 199

XVII. On the Detection of Lung-tissue in the Expectoration of Persons affected with Phthisis. By Samuel Fenwick, M.D., Assistant-Physician to the City of London Hospital for Diseases of the Chest. . . 209

Index 221

LIST OF THE PLATES.

PAGE

I. Multiple Neuromata affecting the Nerves of the Spinal Canal: general view of the Spinal Cord, with the principal nerve (Mr. SIBLEY) 44

II. Granular Degeneration of the Voluntary Muscles; (figs. 1 to 5) microscopic appearances (Dr. MERYON) . 50

III. Atrophy or Degeneration of the Muscles: Disease of the Spinal Cord, with enormously dilated Blood-vessels (Mr. G. L. COOPER and Mr. LOCKHART CLARKE) . 174

IV. Case of Elephantiasis Arabum (Mr. T. BRYANT) . 188

V. Ditto, after application of a ligature to the External Iliac Artery (Mr. T. BRYANT) 188

WOODCUTS.

Colloid Substance from the interior of Cyst, in the case of Multiple Neuromata of Nerves of the Spinal Cord (Mr. SIBLEY) 43

Portions of Expectorated Lung-tissue as they appear under the microscope, Fig. 1 (Dr. FENWICK) . . 212

Ditto; Fig 2 (ditto) 213

OBSERVATIONS

ON THE

EFFECT OF COFFEE ON THE UREA AND CHLORIDES IN HEALTH.

BY

CHARLES E. SQUAREY, M.R.C.S.,

RESIDENT MEDICAL OFFICER TO THE LONDON FEVER HOSPITAL; LATE PHYSICIAN'S ASSISTANT AT UNIVERSITY COLLEGE HOSPITAL.

COMMUNICATED BY

A. B. GARROD, M.D., F.R.S.

Received Oct. 12th.—Read Nov. 14th, 1865.

I was induced to make these observations from a discussion which occurred, whilst I was doing duty at the Fever Hospital, as to the effect of coffee in the treatment of typhus fever, and in which doubts were expressed as to the truth of the observations of Lehmann and Böcker.

My observations were made whilst I was living at University College Hospital as physician's assistant, so that I had great opportunities for making them carefully.

To Dr. Russell Reynolds my best thanks are due for his kindness in permitting me to carry them out on patients admitted under his charge.

The experiments were made on three cases: two were patients, the third was myself.

The urine was collected every morning at 8 a.m., and

examined the same day, for urea, and latterly for chlorides. Both analyses were made by Liebig's volumetric method. In analysing the urea the chlorides were not separated, but two cubic centimètres of the test solution used for urea were subtracted, the same as is usually allowed.

During the time the analyses were being made, the patients were kept on a stated diet, the ordinary diet of hospitals, consisting of bread, 16 oz.; mutton (roast), 12 oz.; potatoes every other day; milk, $\frac{1}{2}$ pint; beer, 1 pint; with occasionally some beef-tea. My own diet was kept as much the same as possible—beefsteaks and mutton chops being the only meat taken. No stimulants of any kind were used during the whole experiments, milk and water being the chief drinks when not taking the coffee.

The same exercise as nearly as possible was taken both by the patients and myself.

The coffee was taken three times daily, at first in $\frac{1}{4}$-oz. doses, and then increased, till at one time I was taking from 4 to 6 oz. daily. Above each table the amount of coffee, and how it was taken, are placed.

The temperature in the cases of the two patients was taken night and morning, and the ranges will be noted when reviewing the state of the patient during each week of coffee and non-coffee taking.

Case 1.—George Plater, æt. 19, by occupation a wheelwright, was admitted into University College Hospital, January 29th, 1864, with symptoms of slight consolidation at the apex of the lung. For four months before admission he had been suffering from hæmoptysis, but it was never at any time copious; at present he coughs little, and the expectoration consists of about six little pellets, of faint yellow or pinkish colour, here and there streaked with blood.

At the commencement of the observations (Feb. 14th) the hæmoptysis had ceased; his weight was 105 lb., or 48 kilogrammes.

The lung symptoms were the same as on admission; there was no sign of any fresh deposition of tubercle.

Throughout the whole course of the observations the patient's health has continued good; he has, in fact, expressed himself as getting better and stronger every day. His temperature noted night and morning has been normal throughout, ranging between 97° and 99° Fahr.

During the first week, from February 14th to February 22nd, no coffee was taken.

2nd week.—On February 22nd, a decoction of coffee was made, by boiling 2 oz. of the powdered bean in 8 oz. of water, and allowed to cool in a stoppered bottle: 1 oz. of this, with the dregs, was taken three times daily from the 22nd to the 28th inclusive. His weight on the 28th was 110 lb., or 50 kilogrammes.

During the third week, from February 29th to March 6th inclusive, no coffee was taken.

4th and 5th weeks.—On March 7th, the patient began to take coffee again, and continued doing so till the 21st: ¼-oz. doses were taken three times daily; but this time the freshly powdered bean was made into an infusion with boiling water, and milk and sugar being added *ad libitum*, dregs and all were swallowed hot. His weight on the 17th was 114 lb., or 52 kilogrammes.

During the 6th week, from March 21st to March 28th inclusive, no coffee was taken.

On the 30th, the patient left the hospital, feeling quite well.

Case 2.—John Taylor, æt. 17, was admitted into University College Hospital, March 17th, 1864, suffering from an attack of subacute rheumatism. The temperature only once rose to 100° Fahr. throughout the attack; there was no pericarditis, but some old endocardial murmurs.

The observations in this case only last one week, owing to an attack of tonsillitis supervening, and the patient leaving the hospital immediately on recovery.

The observations were commenced on April 4th, and continued till April 11th. Throughout the week his health was good; he had no pain or stiffness in any of his joints, and his appetite was very good.

The coffee was taken three times a day in ½-oz. doses, an infusion being made as in the last case, and dregs and all swallowed hot with milk and sugar. The temperature noted night and morning ranged between 97° and 99° Fahr. Patient's weight on the 12th was 115 lb., or rather more than 52 kilogrammes.

Case 3.—The third series of observations were made on myself, and extended over a longer period than either of the others. At the time of making them my health was good in every respect; weight was 140 lb., or 64 kilogrammes.

The observations commenced on February 15th; during the first week, from February 15th to February 22nd, no coffee was taken.

Diet.—Breakfast, 8 a.m., eggs, bread and butter, milk. Lunch, 1 p.m., bread and butter, water. Dinner, 5 p.m., beefsteaks, vegetables, pastry, and water; and generally, about 8 p.m., some milk, with some bread and butter.

2nd week.—From 22nd to 28th of February, coffee was taken three times a day—at breakfast, lunch, and dinner; three breakfast-cups of a strong infusion at each meal, with milk and sugar. The diet was the same; health good.

3rd week.—From February 29th to March 6th inclusive, no coffee was taken; mutton chops were substituted for beefsteaks at dinner—otherwise the diet was the same; health good.

4th and 5th weeks.—From March 7th to March 20th inclusive, coffee was taken three times daily in ¼-oz. doses. It was made into an infusion as in the first case, and milk and sugar being added, the dregs and all were swallowed. The diet was the same as in the last week; the stools were of a rather dark colour from the coffee-grains swallowed; health good.

6th week.—From March 21st to March 27th inclusive, no coffee was taken; beefsteaks were substituted for chops at dinner—the diet was otherwise the same.

7th and 8th weeks.—From March 28th to March 31st, ½-oz. doses of coffee were taken twice daily, an infusion being

made and taken in the same way as in previous weeks. Not feeling very well on April 1st, I left off taking coffee till the 4th, when I again took ½-oz. doses of coffee three times a day. An infusion was made, and the dregs swallowed as before; the diet was the same as in the last week; stools were very costive and dark-coloured; the urine of April 10th was lost; no coffee was taken.

9th week.—On the 11th and 12th of April, ½-oz. doses of coffee were taken three times daily; on the 13th and 14th, 1-oz. doses were taken twice daily; on the 15th and 16th, 2-oz. doses were taken three times daily; but finding that the large amount of coffee-grains swallowed very much impaired my appetite, the coffee was the last four days boiled in water, strained, and then taken with milk and water. Health was pretty good; urine of 16th and 17th of April was lost.

10th week.—On the 18th the coffee was left off, and none taken since. The urine was examined till the 25th of April; health this week better; appetite improved.

Conclusions.—In the first case, the patient, G. Plater, was throughout the observations gaining strength and weight, and the analyses show a regular increase in the amount of urea excreted.

On comparing corresponding coffee and non-coffee weeks, no appreciable difference is to be found. The greatest is in the first (non-coffee) week and the second (coffee) week; the daily average in the second week, when ¼-oz. doses of coffee were being taken three times daily, being 2·198 grammes more than in the first week, when no coffee was taken.

In the third (non-coffee) and fourth (coffee) weeks, the daily average was slightly less in the latter, when ½-oz. doses were taken three times a day. The difference, however, was only ·424 of a gramme; and, again, in the fifth week, when the coffee was taken the same as in the fourth week, the average per day was more by ·515 of a gramme than in the sixth week, when no coffee was taken.

Daily average of Urea excreted per kilogramme of Body-weight.

Non-Coffee Weeks.	Coffee Weeks.
In the first week = ·355 grammes.	In the second week = ·385 grammes.
third week = ·450 „	fourth week = ·440 „
sixth week = ·460 „	fifth week = ·470 „

In the second case, John Taylor, æt. 17, weight 115 lb., or 52 kilogrammes, owing to an attack of tonsillitis supervening in the middle of the observations, and the patient leaving immediately on recovery, the effect of coffee on the urea can only be estimated by comparing the amount passed per kilogramme of body-weight during the observations with the normal amount in health. Patient passed on the average ·428 of a gramme of urea per kilogramme; he was taking ½-oz. doses of coffee three times daily.

In the third series of observations, made on myself, we find, on comparing the analyses of corresponding weeks, that in the first (non-coffee) and in the second (coffee) weeks, the daily average was rather greater in the latter, when three cups of a strong infusion of coffee were taken three times a day; it being 34·080 grammes in the second week, to 33·699 grammes in the first week.

In the third and fourth weeks, the excess was in the non-coffee week, the daily average in the third week, when no coffee was taken, being 36·281 grammes, and in the fourth week, when ¼-oz. doses of coffee were taken three times a day, only 31·182 grammes; thus less in the coffee-taking week by 5·099 grammes: yet in the next (fifth) week, the same amount of coffee being taken, the daily average rose to 33·705 grammes; and, again, in the following (sixth) week, no coffee being taken, the daily average fell to 32·962 grammes, less by ·743 of a gramme than in the previous coffee-taking week.

During the seventh week, the amount of coffee was increased to ½ oz. twice daily; in the three days during which

the urine was examined, the daily average was 34·210 grammes.

In the eighth week, ½-oz. doses of coffee were taken three times daily; yet there was rather an increase than a diminution in the amount of urea excreted, 34·375 being the daily average.

Up to this time the coffee-grains had been swallowed in the infusion at each dose; but the large amount of solid matter thus introduced into the stomach materially affected the appetite, which now was not so good as it had previously been, and the effect on the stools was to render them very costive and almost black, so that in the next (ninth) week on increasing the dose to 1 oz. the grains were strained off.

9th week.—On the 11th and 12th of April, ½-oz. doses were taken three times daily; on the 13th and 14th of April, 1-oz. doses were taken three times daily; on the 15th and 16th of April, 2-oz. doses were taken three times daily. The result was that the daily average of urea fell to 32·291 grammes, which, however, was not less than in the sixth week, when no coffee was taken.

During the tenth week no coffee was taken, at the same time the diet was not so strict,—meat being taken as well as eggs for breakfast, and varied daily at dinner; and on referring to the notes, I find "felt much better—appetite better," entered daily. This week the average rose to 37·086 grammes per day, greater by 4·161 grammes than in the previous week.

Daily average of Urea excreted per kilogramme of Body-weight in each week.

Non-Coffee Weeks.		Coffee Weeks.	
In the first week	= ·535 grammes.	In the second week	= ·541 grammes.
second week	= ·576 ,,	fourth week	= ·495 ,,
third week	= ·523 ,,	fifth week	= ·535 ,,
tenth week	= ·588 ,,	seventh week	= ·543 ,,
		eighth week	= ·545 ,,
		ninth week	= ·524 ,,

These results, I think, show that coffee does not diminish

the excretion of urea in health by any appreciable amount when taken in the above doses. In fact, only in my own case has there been any diminution at all; whilst in the first case, G. Plater, there was an actual increase throughout the observations; and in the second case, John Taylor, the average was by no means below the normal amount.

It is very questionable whether the diminution in my own case was due to the coffee—firstly, because it did not recur regularly during each period of coffee-taking, and, secondly, it was not beyond the limits frequently noted in health.

The diminution only occurred twice, in the fourth week, when it was less by 5·099 grammes than in the preceding week, and in the ninth, when it was less by 4·161 grammes than in the tenth week; but it is hardly fair to take the latter into consideration, as during the ninth week I was not feeling well, and my appetite was not good, owing, no doubt, to the large amount of coffee that had been taken, and to the strictness of the diet, which, from February 15th till April 16th, had only been varied by substituting beefsteaks for mutton chops for dinner in alternate fortnights. In the tenth week, the diet being varied, my appetite improved, and, naturally, the daily excretion of urea increased.

2nd. The diminution is not beyond the limits frequently noted in health; for I find that Dr. Parkes, in his book on the Urine, says that "the maximum and minimum amounts passed in any one day by an individual are usually about $\frac{1}{5}$th above and below his mean amount;" so that in my own case, passing on the average about 34 grammes daily, the diminution or increase of 6 grammes would in no way be abnormal. And again I find, on examination, that the difference between the maximum and minimum amounts in each week of coffee and non-coffee taking is, in the coffee weeks 6·883 grammes, and in the non-coffee weeks about 10·911 grammes, the former amount being even a greater difference than between any two weeks throughout the observations.

3rd. Throughout the whole course of the observations, the amount of urea excreted per kilogramme of body-weight was

only once below the normal amount, and then only by ·005 of a gramme.

Chlorides.—In the first case, G. Plater, during the two weeks that coffee was taken in ¼-oz. doses three times daily, the average was as nearly the same as possible as in the two corresponding weeks, when no coffee was taken; no increase or diminution worthy of remark, one way or the other.

Amount per kilogramme of Body-weight in each week.

Coffee-taking Weeks.	Non-Coffee Weeks.
In the fourth week = ·14 grammes.	In the third week = ·14 grammes.
fifth week = ·152 „	sixth week = ·15 „

This, according to Dr. Parkes, would be at the normal rate.

As a last observation on the patient, I gave him, on March 28th, three ½-oz. doses of coffee, dregs swallowed: this gave him violent abdominal pains in the night, which, however, were soon relieved by hot fomentations. On the 29th he did not take any coffee.

Analysis of Urine for the two days.

	Amount of water.				Urea.	Chlorides.
	C.C.	Sp. gr	React.	Alb.	Grammes	Grammes.
March 29. Coffee	2860	1006	Acid	None	22·880	31·460
30. Non-Coffee ...	475	1027	„	„	21·285	1·485

Here it will be seen that the water and the chlorides were largely increased, the chlorides amounting to ·617 per kilogramme of body-weight; the urea remained normal.

On the next day, no coffee having been taken, the water was much lessened; the urea still remained normal, but the chlorides were reduced to ·029 of a gramme per kilogramme of body-weight. Unfortunately, the patient left the hospital

the next day, so that this interesting point could not be followed up.

In the second case, J. Taylor, ½-oz. doses of coffee were given at once, with the hope that the same interesting result would follow as in the first case; but on referring to the table his daily average will be found to be not more than 8·444 grammes, or ·162 gramme per kilogramme of body-weight—a rather large but certainly not abnormal amount for a boy of his age and weight.

In the third set of observations, as in the second, no definite result has been arrived at. The average is above the normal rate throughout.

Daily average per kilogramme of Body-weight in each week.

Non-Coffee Weeks.		Coffee Weeks.	
In the third week	= ·226 grammes.	In the fourth week	= ·203 grammes.
sixth week	= ·221 ,,	fifth week	= ·251 ,,
tenth week	= ·202 ,,	seventh week	= ·272 ,,
		eighth week	= ·168 ,,
		ninth week	= ·181 ,,

It was lowest in the eighth week, when ½-oz. doses were being taken three times daily, and highest in the seventh week, when ½-oz. doses of coffee were being taken twice daily.

In conclusion, I may say that neither the patients nor myself suffered in any way any ill effects from the coffee; not even when taking 1 and 2-oz. doses at a time did I suffer from any headache, giddiness, or unsteadiness of the hands: on the contrary, I always felt when taking it more lively and fit for work after meals.

The pulse, examined two or three times in the case of the patients, was found to be generally increased a few beats for about an hour after taking the coffee.

Analysis of Urine in First Case (G. PLATER).

First week.—Non-Coffee.

Date.	Amount of water.					Urea.		Chlorides.	
Feb.	C.C.	Oz.	Sp. gr.	React.	Alb.	Grms.	Grains.	Grms.	Grains.
15	725	25½	...	Acid	None	15·765	240·20	...	...
16	735	26	...	,,	,,	15·162	231·97	...	...
17	Lost	...	...	,,	,,	...	...	...	...
18	1240	43½	...	,,	,,	16·977	258·74	...	...
19	1290	45¼	...	,,	,,	16·845	257·72	...	...
20	1095	38½	...	,,	,,	19·217	294·02	...	...
21	1350	47½	...	,,	,,	17·350	265·45	...	...
22	1150	40½	...	,,	,,	16·425	251·32	...	...

	Grammes.		Grains.
Average per diem of urea	16·820	or	259·02
Amount per kilogramme of body-weight . .	·355		

Second week.—Coffee taken (¼ ounce doses three times daily).

Date.	Amount of water					Urea.		Chlorides.	
Feb.	C.C.	Oz.	Sp gr.	React.	Alb.	Grms.	Grains.	Grms.	Grains.
23	1560	55	...	Acid	None	22·975	341·51	...	...
24	1750	61½	...	,,	,,	18·230	278·51	...	...
25	1565	55	...	,,	,,	15·987	244·60	...	...
26	1065	37½	...	,,	,,	18·032	275·88	...	...
27	655	23¼	...	,,	,,	21·417	327·68	...	...
28	1370	48	...	,,	,,	19·320	295·59	...	...
29	1165	41	...	,,	,,	17·167	262·65	...	...

	Grammes.		Grains.
Average per diem of urea	19·018	or	292·87
Amount per kilogramme of body-weight . .	·385		

Third week.—Non-Coffee.

Date.	Amount of water.					Urea.		Chlorides.	
March.	C.C.	Oz.	Sp. gr.	React.	Alb.	Grms.	Grains.	Grms.	Grains.
1	965	34	...	Acid	None	23·170	356·81	6·082	93·66
2	Lost	...	...	,,	,,	...	...	...	...
3	1400	49¼	...	,,	,,	21·940	337·87	7·060	108·72
4	860	30¼	...	,,	,,	23·479	361·57	6·630	102·10
5	1195	42	...	,,	,,	23·160	356·63	7·108	109·46
6	1820	64	...	,,	,,	23·977	369·24	9·279	142·89
7	1195	42	...	,,	,,	17·742	273·22	6·875	105·87

	Grammes.		Grains.
Average per diem of urea	22·244	or	342·5
Amount per kilogramme of body-weight	·45		
Average per diem of chlorides	7·172		
Amount per kilogramme of body-weight	·14		

Fourth week.—Coffee taken (¼-ounce doses three times daily, hot).

Date.	Amount of water.					Urea.		Chlorides.	
March.	C.C.	Oz.	Sp. gr.	React.	Alb.	Grms.	Grains.	Grms.	Grains.
8	1495	52½	...	Acid	None	21·712	334·35	...	...
9	1355	47½	...	,,	,,	20·590	317·08	7·585	116·8
10	950	33½	...	,,	,,	18·039	277·80	6·407	98·6
11	1890	68½	...	,,	,,	26·730	391·64	10·260	158·0
12	1030	36¼	...	,,	,,	23·535	362·43	6·355	97·8
13	1280	45	...	,,	,,	21·905	337·33	7·255	111·7
14	1300	45½	...	,,	,,	20·235	311·61	5·103	78·5

	Grammes.		Grains.
Average per diem of urea	21·820	or	336·02
Amount per kilogramme of body-weight	·444		
Average per diem of chlorides	7·162	or	110·29
Amount per kilogramme of body-weight	·14		

Fifth week.—Coffee taken, same as last week.

Date.	Amount of water.					Urea.		Chlorides.	
March.	C.C.	Oz.	Sp. gr.	React.	Alb.	Grms.	Grains.	Grms.	Grains
15	1690	59½	...	Acid	None	24·340	374·8	8·055	124·0
16	1185	41½	...	,,	,,	22·097	340·2	6·698	103·1
17	1575	55½	...	,,	,,	25·145	387·2	7·986	122·9
18	1585	55½	...	,,	,,	24·707	380·4	7·097	109·2
19	1360	48	1015	,,	,,	24·480	376·9	6·463	99·5
20	2020	71	1011	,,	,,	28·280	435·5	11·110	171·0
21	1010	35½	1016	,,	,,	19·695	303·3	7·070	108·8

	Grammes.		Grains.
Average per diem of urea	24·106	or	371·2
Amount per kilogramme of body-weight . .	·472		
Average per diem of chlorides	7·782	or	119·8
Amount per kilogramme of body-weight . .	·152		

Sixth week.—Non-Coffee.

Date.	Amount of water.					Urea		Chlorides.	
March.	C.C.	Oz.	Sp. gr.	React.	Alb.	Grms.	Grains.	Grms.	Grains.
22	1325	46½	1015	Acid	None	21·862	336·67	6·625	102·02
23	1295	45½	1010	,,	,,	16·835	259·25	6·475	98·91
24	1515	53¼	1014	,,	,,	25·785	396·62	8·322	127·35
25	Lost	...	1015	,,	,,	...	...	...	...
26	1280	45	1016	,,	,,	24·960	384·38	7·680	118·27
27	1400	49¼	1016	,,	,,	27·300	420·42	9·100	140·14
28	1155	40½	1017	,,	,,	24·832	382·41	6·352	97·82

	Grammes.		Grains.
Average per diem of urea	23·591	or	363·3
Amount per kilogramme of body-weight . .	·463		
Average per diem of chlorides	7·426	or	114·36
Amount per kilogramme of body-weight . .	·15		

Analysis of Urine in Second Case (J. Taylor).

Coffee taken three times daily, in ½-ounce doses.

Date.	Amount of water.					Urea.		Chlorides.	
April.	C.C.	Oz.	Sp. gr.	React.	Alb.	Grms.	Grains.	Grms.	Grains.
5	1320	46½	1015	Acid	None	21·120	325·3	7·260	111·8
6	1410	49	1015	„	„	21·855	336·5	9·870	151·9
7	Lost	...	1025	„	„	...	...	...	...
8	1680	59	1015	„	„	26·040	401·0	9·000	138·5
9*	500?	17½	1024	„	„	13·250	...	3·250	...
10	Lost	...	...	„	„	...	...	...	...
11	1005	35	1016	„	„	20·602	317·2	8·040	123·8
12	1150	40½	1016	„	„	21·850	336·5	8·050	123·9

	Grammes.		Grains.
Average per diem of urea	22·293	or	343·3
Amount per kilogramme of body-weight	·428		
Average per diem of chlorides	8·444	or	130
Amount per kilogramme of body-weight	·162		

* Man declared he had lost none, but still it is doubtful.

Analysis of Urine in Third Case (C. E. S.).

First week.—Non-Coffee.

Date.	Amount of water.					Urea.		Chlorides.	
Feb.	C.C.	Oz.	Sp. gr.	React.	Alb.	Grms.	Grains.	Grms.	Grains.
16	885	31	...	Acid	None	28·860	444·4	...	...
17	Lost	...	...	„	„	...	...	...	...
18	920	32½	...	„	„	31·855	490·5	...	...
19	1055	37	...	„	„	32·102	494·3	...	...
20	1055	37	...	„	„	37·105	571·4	...	...
21	1340	47	...	„	„	40·155	618·3	...	...
22	1120	39½	...	„	„	32·120	494·6	...	...

	Grammes.		Grains.
Average per diem of urea	33·699	or	519·9
Amount per kilogramme of body-weight	·535		

Second week.—Coffee taken (3 breakfast-cups of a strong infusion three times a day).

Date.	Amount of water.					Urea.		Chlorides.	
Feb.	C.C.	Oz.	Sp. gr.	React.	Alb.	Grms.	Grains.	Grms.	Grains.
23	1075	37½	...	Acid	None	35·647	548·9	...	...
24	1445	50½	...	„	„	37·127	571·7	...	...
25	1515	53	...	„	„	32·982	507·9	...	...
26	1080	37½	...	„	„	33·685	518·1	...	...
27	870	31	...	„	„	29·812	459·1	...	...
28	740	26	...	„	„	31·547	485·8	...	...
29	1085	37½	...	„	„	37·765	581·5	...	...

	Grammes.		Grains.
Average per diem of urea	34·080	or	524·8
Amount per kilogramme of body-weight . .	·541		

Third week.—Non-Coffee.

Date.	Amount of water.					Urea.		Chlorides.	
March.	C.C.	Oz.	Sp. gr.	React.	Alb.	Grms.	Grains.	Grms.	Grains.
1	Lost	...	...	...	...	...	...	...	...
2	1060	37	...	Acid	None	44·454	685·0	13·283	204·5
3	Lost	...	...	„	„	...	...	...	...
4	855	30½	...	„	„	33·155	510·5	13·775	212·1
5	880	31	...	„	„	34·160	526·0	13·960	214·9
6	965	34	...	„	„	34·935	572·9	14·255	219·5
7	1100	38½	...	„	„	34·700	534·0	15·880	244·5

	Grammes.		Grains.
Average per diem of urea	36·281	or	558·7
Amount per kilogramme of body-weight . .	·576		
Average per diem of chlorides	14·230	or	219·1
Amount per kilogramme of body-weight . .	·226		

Fourth week.—Coffee taken ($\frac{1}{4}$-ounce doses three times daily—grains swallowed).

Date.	Amount of water.					Urea.		Chlorides.	
March.	C.C.	Oz.	Sp. gr.	React.	Alb.	Grms.	Grains.	Grms.	Grains.
8	815	28½	...	Acid	None	30·560	470·6	...	...
9	995	35	...	,,	,,	34·140	525·7	13·637	210·0
10	875	31	...	,,	,,	29·137	448·7	12·425	191·3
11	1420	50	...	,,	,,	31·400	483·5	16·540	254·7
12	765	27	...	,,	,,	26·340	385·6	10·402	160·1
13	1045	37	...	,,	,,	34·917	537·7	14·297	220·1
14	940	33	...	,,	,,	29·780	458·6	9·580	147·5

	Grammes.		Grains.
Average per diem of urea	31·182	or	480·2
Amount per kilogramme of body-weight . .	·495		
Average per diem of chlorides	12·813	or	197·3
Amount per kilogramme of body-weight . .	·203		

Fifth week.—Coffee taken (same way as in last week).

Date.	Amount of water.					Urea.		Chlorides.	
March.	C.C.	Oz.	Sp. gr.	React.	Alb.	Grms.	Grains.	Grms.	Grains.
15	1080	37½	1031	Acid	None	36·270	558·3	15·470	238·2
16	955	33½	1030	,,	,,	35·647	548·9	14·207	218·7
17	1045	37	1028	,,	,,	32·555	501·3	15·252	234·8
18	1020	36	1030	,,	,,	33·812	520·7	16·087	248·7
19	885	31	1029	,,	,,	29·647	456·5	13·717	211·2
20	1225	43	1020	,,	,,	34·300	528·3	20·217	311·3
21	Lost	...	...	...	...	...	...	...	...

	Grammes.		Grains.
Average per diem of urea	33·705	or	519
Amount per kilogramme of body-weight . .	·535		
Average per diem of chlorides	15·826	or	243·7
Amount per kilogramme of body-weight . .	·251		

Sixth week.—Non-Coffee.

Date.	Amount of water.					Urea.		Chlorides.	
March.	C.C.	Oz.	Sp. gr.	React.	Alb.	Grms.	Grains.	Grms.	Grains.
22	890	31	1030	Acid	None	30·260	466·0	13·795	212·4
23	1240	44	1025	„	„	37·820	582·4	14·260	219·6
24	885	31	1030	„	„	29·205	449·7	12·390	190·8
25	770	27	1029	„	„	29·260	450·6	9·635	148·2
26	1165	37½	1027	„	„	36·115	556·1	15·727	242·2
27	1305	46	1022	„	„	32·235	496·4	...	...
28	1280	45	1025	„	„	35·840	551·9	17·920	275·9

	Grammes.		Grains.
Average per diem of urea	32·962	or	507·6
Amount per kilogramme of body-weight . .	·523		
Average per diem of chlorides	13·953	or	214·8
Amount per kilogramme of body-weight . .	·221		

Seventh week.—Coffee taken (½-ounce doses twice daily—grains swallowed).

Date.	Amount of water.					Urea.		Chlorides.	
March.	C.C.	Oz.	Sp. gr.	React.	Alb.	Grms.	Grains.	Grms.	Grains.
29	1420	49½	1025	Acid	None	35·500	546·7	19·800	304·9
30	1035	36	1029	„	„	31·567	486·1	14·490	223·1
31	950	37	1030	„	„	35·575	547·8	...	...
April 1									
2	No coffee taken.					Not well.			
3									

	Grammes.		Grains.
Average per diem of urea	34·210	or	526·8
Amount per kilogramme of body-weight . .	·543		
Average per diem of chlorides	17·145	or	264·0
Amount per kilogramme of body-weight . .	·272		

Eighth week.—Coffee taken ($\frac{1}{2}$-ounce doses three times daily, as in last week).

Date.	Amount of water.					Urea.		Chlorides.	
April.	C.C.	Oz.	Sp. gr.	React.	Alb.	Grms.	Grains.	Grms.	Grains.
5	890	31½	1033	Acid	None	36·045	555·0	12·015	185·0
6	720	26	1033	„	„	30·960	476·7	6·840	105·3
7	705	24½	1032	„	„	34·897	537·4	6·345	97·7
8	1300	44	1023	„	„	37·700	580·5	14·950	228·1
9	890	31½	1029	„	„	34·710	534·3	12·905	198·7
10	875	31	1027	„	„	31·937	491·8	10·500	161·7

	Grammes.		Grains.
Average per diem of urea	34·375	or	529·3
Amount per kilogramme of body-weight . .	·545		
Average per diem of chlorides	10·592	or	162·3
Amount per kilogramme of body-weight . .	·168		

Ninth week.—Coffee taken daily. (For quantity taken at each dose, see note of Case 3, ninth week.)

Date.	Amount of water.					Urea.		Chlorides.	
April.	C.C.	Oz.	Sp. gr.	React.	Alb.	Grms.	Grains.	Grms.	Grains.
12	765	27	1030	Acid	None	31·305	482·0	...	...
13	890	31½	1031	„	„	34·265	527·6	...	...
14	920	32½	1028	„	„	33·580	517·1	11·960	184·1
15	1000	35	1026	„	„	34·000	523·6	13·000	200·2
16	805	27	1030	„	„	31·395	383·4	9·257	142·7

	Grammes.		Grains.
Average per diem of urea	32·921	or	537·1
Amount per kilogramme of body-weight . .	·524		
Average per diem of chlorides	11·405	or	175·6
Amount per kilogramme of body-weight . .	·181		

Tenth week.—Non-Coffee.

Date.	Amount of water.					Urea.		Chlorides.	
April.	C.C.	Oz.	Sp. gr.	React.	Alb.	Grms.	Grains.	Grms.	Grains.
19	775	27¼	1027	Acid	None	30·225	465·5	8·912	137·2
20	1165	41	1027	,,	,,	40·775	627·9	16·310	251·1
21	1135	39½	1025	,,	,,	36·320	559·3	17·025	262·1
22	1025	36	1027	,,	,,	34·850	536·6	16·360	251·9
23	1170	41	1030	,,	,,	44·660	687·7	16·380	252·2
24	860	30¼	1031	,,	,,	35·690	549·6	20·210	311·2
25	Lost	...	...	,,	,,	...	...	...	...

	Grammes.		Grains.
Average per diem of urea	37·086	or	571·1
Amount per kilogramme of body-weight . .	·588		
Average per diem of chlorides	15·866	or	244·3
Amount per kilogramme of body-weight . .	·588		

CASE IN WHICH THE OPERATION

OF

TREPHINING OF THE SPINE WAS PERFORMED.

BY

SAMUEL GORDON, M.B.,

PHYSICIAN TO THE RICHMOND, WHITWORTH, AND HARDWICKE HOSPITALS.

COMMUNICATED, WITH OBSERVATIONS, BY

ROBERT MACDONNELL, M.D., F.R.S.,

SURGEON TO JERVIS ST. HOSPITAL, DUBLIN.

Received Nov. 18th.—Read Nov. 28th, 1865.

Michael C—, a slight and well-made, although rather pallid and wasted man, 31 years of age, was admitted into the Whitworth Hospital, under Dr. Gordon's care, on May 27th, 1865. For some years he had been employed as an engineer on railways in the United States, and describes himself as having been a person of sober steady habits, active and healthy, up to the 27th of March last, when he met with an accident, of which he gives the following account:

Whilst hunting, his horse shied at a fence, and he was flung off into a gripe on his back, which came in contact with some stones. Immediately his lower limbs were paralysed; he made an effort to get up, but found that he was completely powerless from the waist downwards. He was carried home in great pain; for four or five days he had retention of

urine, requiring the introduction of the catheter; at this period the distension of the bladder caused acute pain.

After this the urine began to dribble away; it became, as he says, "very offensive and full of corruption-like matter."

From the first he had paralysis of the sphincter ani, with involuntary passage of fæces. For five weeks after the accident he was not conscious of sensation in the lower limbs; he had occasional priapism.

After admission to hospital he was carefully examined; his condition was as follows:

In the lower limbs muscular power was entirely lost as far up as the knees; except the sartorius, the muscles of the thigh had little or no power; he had no power over either the bladder or rectum. Sensation was lost in both feet; from the ankle to the knee he felt obscurely, the left leg being almost devoid of sensibility. There was hyperæsthesia of each thigh on the right side to so great an extent that he was distressed by rubbing the hand across the surface of it. Below the knee he could appreciate the difference between heat and cold—a vessel of warm water which, applied to the left thigh, was of an agreeable temperature, when applied to the right caused him to cry out that he was burned. He could tell without seeing them the position in which the lower limbs were placed. No reflex movements could be excited in any of the muscles below the knees; in each thigh reflex motion was readily aroused; on the right side the slightest touch of a hair, or even blowing on the surface, caused vigorous contractions, especially of the sartorius muscle. The lower limbs were considerably wasted; there was no œdema of the feet or ankles, which were bedewed with perspiration; the penis and scrotum were large and flabby, but not ulcerated; the orifice of the urethra was inflamed so that it was not possible to introduce a double-channelled silver catheter (size No. 10); a bed-sore about the size of half-a-crown had formed on the back. The urine was alkaline, very muddy and fœtid, containing a copious muco-purulent deposit; it was tinged with blood, and constantly dribbled away.

Upon examining the spinal column, the spinous process of one of the lower vertebræ was found to project to the extent shown in the accompanying cast; this projection was at a distance of four inches above a circle made round the body at the level of the umbilicus, and was not movable. The last dorsal or first lumbar vertebra was thus indicated as probably the seat of the injury.

The nature of his case and of the proposed operative procedure having been explained to the patient, the operation of trephining the spine was undertaken at his request. June 3rd.—Chloroform was given to the patient without his being removed from the bed on which he lay; the bed was then lifted opposite to a window, with the foot of it towards the light, and the patient was turned over on his face. An incision four inches long was made over the projecting spinous process of the vertebra already indicated; the tendinous origins of the spinal muscles were divided on each side close to the bone, and the muscular mass drawn aside by means of broad retractors; ice was then applied for a time until the venous hæmorrhage, which was not alarming, had entirely ceased. After ascertaining with the finger the extent of inequality which existed along the groove on each side of the spinous processes, it was resolved to remove the posterior arch of that vertebra the spinous process of which projected. This was accordingly done by cutting through the laminæ with bone forceps, and dividing the interspinous ligaments. The necrosis forceps which were used to grasp the spinous process of the portion about to be removed unfortunately nipped off this process near to its root, and thus caused some delay in removing the remaining part, of which it was now difficult to get a secure hold. After this was effected, however, the theca of the cord was brought into view at the bottom of the wound; there was no tension of it, neither was there any evidence of blood having been effused within it—it was therefore not opened.

As soon as all bleeding had ceased the wound was lightly dressed with water-dressing (a small piece of sponge having been put into the bottom of it), and the patient placed on his

side. The operation lasted fifty minutes; the amount of blood lost was not considerable.

The chloroform administered had produced sickness of stomach, which continued all day, and distressed the patient greatly.

He was ordered $\frac{1}{4}$ a grain of atropine in 6 ounces of water—dose, 1 drachm three times a day.

His exact condition, for some days after the operation, was reported as follows by Mr. Harman, clinical clerk.

June 4th (day succeeding operation).—Had not slept; stomach still irritable; felt great pain about the wound; has some sensation in the soles of the feet; had some wine; pulse fell during the day, but rose to 128 in the evening.

5th (second day after operation).—Looks uneasy and feverish, but talks cheerfully; ropy mucus in urine diminished; no signs of returning voluntary power over the bladder; reflex movements in the thighs not so readily excited as before the operation; the hyperæsthesia in the thighs diminished; no evidence of improved motor power in the lower limbs.

6th (third day).—Slept well; looks much better, and has regained his good temper; bowels confined; pulse 112; urine alkaline, and in appearance as it has been; a poultice was applied to the wound in the back, which is discharging freely; appetite good; complains of his vision being affected by the atropine.

7th (fourth day).—Pulse 110, good; complains of uneasiness in the back; the wound not looking so well as yesterday; warm dressing ordered to be applied underneath the poultice. Urine acid, and, although high coloured, depositing little sediment.

8th (fifth day).—Slept tolerably well; urine alkaline, copious, containing less deposit; sp. gr. 1011; an enema, which was administered to relieve flatulence, was not retained, the sphincter ani being completely paralysed; wound looks much better, its edges clean, the vertebral theca visible at the bottom of it. No appreciable difference as regards the functions of motion and sensation since the report of the

5th; bed-sore healing. Atropine continued; ordered also iodide of potassium.

14th (eleventh day).—Had a motion from the bowels, of the passage of which he was perfectly conscious; urine still alkaline, requiring to be drawn off by catheter. Bladder carefully washed out with tepid water every day.

17th (fourteenth day).—Urine acid and free from blood; bed-sore quite healed. The wound has made such good progress that he can lie on his back, and from this change of position he finds great relief; sensation in the thighs is now quite normal, both as to touch and temperature; sensation in the right leg and dorsum of the foot nearly normal, less perfect in the left leg. The power of the muscles of the thighs is so much increased that on flexing the knee he can straighten it; there is no sign of movement, however, in the muscles of the calf or toes.

23rd.—Urine continues acid since last report; the condition of the urethra is so much improved since the operation, that the double-channelled catheter, which could not be introduced before, now enters the orifice of the urethra readily, and is used accordingly for washing out the bladder.

29th.—Bladder daily regaining power; he can make water so as to empty it completely; urine still acid, free from blood and mucus.

July 12th.—For the last eight or nine days he has not required the introduction of the catheter at all, the power over the bladder being such as to force the water to a considerable distance (two feet). He complains much of pain in the lower limbs, which disturbs his rest. These are relieved by shampooing and rubbing in a liniment containing extract of belladonna and tinct. of aconite; has no startings in the legs; the accompanying portions of bone (weighing 1 grain) came this day from wound, which is closing in fast.

July 26th (in less than eight weeks from the operation).—Was able to go out to-day for an hour in a basket carriage, reclining on his back, and enjoyed it greatly; feels the back so strong that he wished to be allowed to sit up. He can turn himself from side to side readily, and with confidence.

From this time the patient went out into the open air daily when the weather permitted; he gained flesh and strength, his only complaints arising from the torpid state of his bowels and pains in the lower limbs.

During the month of August he had an attack attended with diarrhœa, sickness, and headache; at this time the urine became neutral, and on two or three occasions alkaline.

On August 24th he was carefully examined, and the following report noted.

His general health is excellent, and he is gaining flesh; urine acid, and free from any deposit, and ejected with force in a good stream; there is no hyperæsthesia of the lower limbs; sensation normal so far as the knees, but below the normal standard from this point downwards; voluntary motion is increased, most so in the left leg, which he can raise off the bed when he lies on his back, and which he can move across the other leg; but these movements are performed by the muscles of the thigh only, those of the calf and toes having no power; he can now sit upright.

He is taking small doses of strychnine, and electricity is used, which latter, although causing lively contractions in the muscles of the thighs, has no effect on those of the calf or toes.

He went out constantly during September and October when the weather permitted, until prevented by a smart feverish cold, with which he was attacked in the latter part of October.

At present he sits upright without the least discomfort or feeling of weakness in the back. He makes water, he says, as well as ever he did; he cannot stand or, of course, make attempt at walking, and although by forcing he can evacuate the bowels, yet the sphincter ani has not regained its power.[1]

I was present at the time when my friend Doctor Gordon

[1] July 25th, 1866.—More than twelve months have now elapsed since the operation. As regards the use of the lower limbs, the patient's state has not improved since last report. Being unable to stand or walk, he moves about in an invalid chair. He has sought employment as a worker at a steam lathe at some iron works in the neighbourhood of Dublin.

operated upon this case, and through his kindness I have had an opportunity of watching it all along. I purpose limiting my observations to a few points connected with the case, and do not mean to enter upon the general question (which I have discussed at some length elsewhere[1]) as to the propriety of trephining in cases of fractured spine.

The case just detailed proves that there is not anything in the operation in question which leads necessarily to a fatal issue, neither is it followed of necessity by very grave consequences in the way of exfoliation of bone, formation of matter, &c., making convalescence from it very tedious if not impossible. The patient was able to go out within eight weeks after the operation.

I do not think that any impartial person, even though differing from the view which I have advocated with regard to this operation, will deny that the operative procedure and the improvement which took place in C—'s case were related to each other as cause and effect.

The diminution of hyperæsthesia and exalted reflex action, the improvement in the urine and in the bed-sore and bladder, the increase of sensibility below the knees as well as of motor power in the thighs, followed the operation in such a way as to leave little doubt that they were due to it. It is possible, and even probable, that the subsidence of the hyperæsthesia and exalted reflex action in the right thigh may have been due, not to the removal of the portion of bone causing pressure or irritation of the cord, but to the counter-irritation produced by the wound beginning to suppurate.

This was the earliest sign of amendment—in consequence of it the patient got great relief from a distressing symptom, but possibly active counter-irritation by blisters or issues might have produced this result, which may also be supposed to have arisen from the internal administration of atropine. But this cannot be said for the disappearance of all muco-purulent deposit and blood from the urine, and the healing of the bed-sore, with, by degrees, the returning acidity of the urine. The improvement in sensation and motor power,

[1] 'Dublin Quarterly Journal of Medical Science,' August, 1865.

although considerable, has not been greater than is sometimes observed in cases not operated on, and which ultimately go to the bad; but the perfect power which he now has over the bladder must, I conceive, in fairness be attributed to the operation. It is interesting to observe that this power became restored by steps just reversing the order in which it is lost in such cases; the water, instead of constantly dribbling away, became retained, so that the use of the catheter was necessary, and it gradually became possible to dispense with it.

I sincerely hope the amount of success which has attended the operation in this case will encourage others to follow Doctor Gordon's example.

When we call to mind Sir Astley Cooper's words, that "if the operation saves only a life in one hundred, it is more than I have yet seen accomplished by surgery," the fact of this patient being in the state he now is must be looked upon as a triumphant result; but may we not expect to profit by the experience of such cases? C—'s case teaches at least two lessons of value with reference to future operations.

1st. The necessity of operating early, before pressure has produced more or less structural change in the cord, and prolonged paralysis has caused atrophy of the muscles.

2nd. The desirability of removing the posterior arch of more than one vertebra; such a proceeding would add little to the difficulty or severity of the operation, and nothing to its danger; it would obviously give a much better chance of the patient's recovery so far as standing and walking are concerned.

AN ACCOUNT

OF AN

ARTERIO-VENOUS CYST IN THE POPLITEAL NERVE,

FOR WHICH THE LIMB WAS AMPUTATED.

BY

CHARLES H. MOORE, F.R.C.S.,

VICE-PRESIDENT OF THE SOCIETY.

Received Nov. 30th, 1865.—Read Jan. 23rd, 1866.

The case described in this paper was one of Traumatic Varicose Aneurism, but the characters of that disease were masked by the prominent peculiarities of the tumour as a cyst, and by its strict limitation within the textures of the nerve. The novel combination of the symptoms thus produced occasioned difficulty in distinguishing the nature of the disease, as well as unusual interest in the treatment of it.

Before the patient came under my care she had been attended by my friend, Dr. James D. Rendle, the medical officer of the Queen's Prison at Brixton, who twice gave me the opportunity of examining her, and who has since favoured me with an account of the early history of her case.

Caroline C—, æt. 31, presented herself to Dr. Rendle on the 10th of March, 1863, with a painless, smooth, tense, oval tumour, of the size of an egg, in the left popliteal space. In

every respect it so nearly resembled a bursal tumour, that it was pronounced without hesitation to be a chronic enlargement of a bursa connected with one of the hamstring muscles.

The woman gave the following clear history of her case :— On the 22nd of May, 1862, whilst she was at work with several other women in turning a crank-pump, she received a blow on the back of her knee from the rotating pump-handle. The blow caused pain, which increased during the day, and then ceased. Just a fortnight after the injury she accidentally noticed at the part which had been struck a painless swelling of the size of a hazel-nut. Her belief is that at this period the swelling was movable, and situated in the middle of the ham. It gradually increased, and by the end of November was of its present size.

June 10th, 1863.—After prolonged rest in bed, leeching, and blistering, the tumour has not diminished in size, but it has altered in character. Its deepest part feels firm and indistinctly nodulated; and it conveys the impression that underneath the smooth soft superficial swelling there may now be a solid deposit of scrofulous matter in the glands of the region. Her general health is unimpaired.

August 5th.—She has been well fed, and has taken a scruple of iodide of potassium daily for the last two months. The tumour has nevertheless somewhat increased in size. She has also been kept in bed; but she is now restless and tired of the constant confinement, and to-day she has left it and gone out.

September 1st.—She returned to Dr. Rendle's care. Since the last date she has been up for a part of every day. The tumour has again increased a little in size. She suffers pain in the bottom of the foot.

December 1st.—There has been no material change in the form of the tumour; but the impression again given on handling it is, that it is certainly fluid and bursal. Upon the introduction of a small trochar at the outer side of the swelling, a little oily, bloody fluid escaped, and afterwards a few drops of pure blood. The swelling afterwards was less tense, and

to the patient felt smaller. No severe pain was occasioned by the introduction of the instrument. A little ecchymosis was noticed around the puncture on the following day, but nothing unfavorable followed.

January, 1864.—By the middle of this month the tumour had considerably increased, and was as large as an orange. Dr. Rendle punctured it again, using an ordinary hydrocele trochar. Again a little oily and bloody fluid first escaped, as on the former occasion of puncturing, and then issued a stream of pure venous blood. This operation caused intense suffering, the pain being chiefly referred to the sole of the foot. The puncture readily healed, but the tumour was not materially diminished in size by the operation.

February 12th.—During the last fortnight there has been a considerable change in the tumour. No longer slow in growth, it has been rapidly enlarging and producing such intense pain that there seems to be a probability of the disease requiring the removal of the limb.

24th.—On her admission into the Middlesex Hospital under my care, the woman was thirty-three years of age, dejected in spirits, pale and pasty in countenance, but not emaciated. She had no appetite, and she took her food as a duty without relish. She had little sleep, and almost constant pain. Her pulse was feeble. There were syphilitic scars on both lower extremities. She laid her knee bent on the outside, and kept it carefully still. The tumour, which had now existed for twenty-one months, was no longer movable. It occupied the whole of the left popliteal space. It expanded the hamstring muscles, and protruded backward in two principal lobes, being grooved down the middle as by a nerve or a vessel. There was no pulsation or redness about the tumour itself, and no œdema, or altered arterial beat, or venous congestion below it. The prominences were tense and elastic; whether they fluctuated was a matter of dispute. To different persons and to the same person at several times a different impression was conveyed. I myself thought I distinguished at one examination the elasticity of medullary cancer; at another, and especially on further flexing the

knee, fluctuation; and I was rather dissatisfied at having, as I supposed, made a mistake, than led to ascertain distinctly if the tension of such a tumour could be made to vary. There was, moreover, difficulty in this, as the woman experienced peculiar suffering from compression or prolonged handling of the tumour, and from raising the limb. When certain parts were touched, she sometimes, though not always, cried out and started, as if a nerve were pricked. Her pain too, that which came on when the swelling was not touched, was of a stabbing and pricking character; it was greatest in the sole of her foot, and it sometimes came on suddenly. The movements of the knee-joint were natural, but limited by the bulk and painfulness of the great swelling behind it. Flexion of the knee slightly lessened the tension of the prominences of the tumour.

29th.—She has improved in her general condition; but to-day, after a night of great suffering, the tumour is still larger, and there is a dark violet discoloration of the skin over it, which fades into a light red on the adjoining portion of the calf; here and there on the leg, and especially on the foot, the skin is unevenly marked with streaks and patches of a brick-red colour, which, though very superficial, is permanent. The foot, to-day, is benumbed.

Feeling an indistinct fluctuation, I thrust a grooved needle into the largest and highest prominence. It entered a cavity. A yellow serous fluid, tinged red, came freely along the groove. Gradually the red tint predominated, and after half an ounce had escaped the fluid was venous blood. It poured as freely forth when six ounces had issued as it had done at first, and, the tension of the tumour being relieved, I withdrew the needle. Although for the most part at ease during this little operation, yet, from time to time, while the needle was being held quite still, she suddenly and bitterly cried out that I was hurting her foot. Blood continued to flow by the puncture after the needle was removed, until stopped with lint soaked in collodion. In three or four minutes after the withdrawal of the needle the tumour was as tense as before; and it was evident that there was some source of

free hæmorrhage within, by which the sac was again filled. The whole of the fluid coagulated in a few minutes. Under the microscope I found in it blood-globules, and one cell, having six times the diameter of a blood-corpuscle, broken on one side and containing a nucleus and nucleolus.

March 2nd.—After the administration of chloroform and the application of a tourniquet, I cut on the inner prominence through smooth bright fascia into a thin cyst, and let out some serum and thin blood. On enlarging the opening black clot escaped, and I put in my finger and turned out a mass of soft fibrin, some small, smooth, and soft white fragments, and more black clot. Fluid blood of a venous character flowed abundantly, washing out clots with it, and had it been bright it might have been supposed to be issuing from a pulseless aneurism. But the tumour was thin and cystic, the lymph was soft and loose, and not laminated, and the blood flowed without jet in a continuous stream. I compressed the lips of the wound around my finger to prevent further hæmorrhage, while I explored the cavity. It was that of a single cyst, with cord-like ridges and sacculated interspaces on its walls, and with other isolated cords, only the ends of which were attached to the walls as in the right ventricle of the heart. Clots lay in the sacculated recesses at the surface of the cyst. The wall itself seemed thin, and, though uneven, was smoothly lined like a bursa. The popliteal artery could be felt immediately in front of the cyst, but there was no aperture in it, and no gush of warm blood was to be felt in any part. The tourniquet, when quite tight, controlled the hæmorrhage, but seemed to augment it if partially screwed up.

The tumour thus proved to be a cyst, which communicated with one or more veins. In what structure it had originated I could not discover, for it had spread its thin wall abroad into close contact with almost every structure in the ham, and was nowhere based on a solid morbid growth. I gave up the hope of dissecting it out; and as the hæmorrhage had been rapid and copious, and its source was deeply seated, I desisted after a brief attempt to search for the bleeding

vessel. Recalling the antecedent history of the patient, whom I knew to be one of a class of persons who readily die of a surgical operation, and who can ill bear a copious suppuration, I decided at once to remove the limb. Amputation exposed her to the least immediate risk, and also freed her from the uncertainty still remaining as to the nature of the disease, which might even yet imperil her recovery.

Examination of the limb.—All the bursæ were found healthy; the popliteal artery and its branches healthy, the vein a little thickened and adherent to the front of the cyst, but otherwise healthy. The posterior tibial nerve, as it approached the tumour, spread out into a hollow cone, which formed the uppermost part of the cyst. The substance of the nerve was continuous with the cyst, some of its separated cords passing in the wall, and others in the cavity of the cyst. Near the soleus the cyst contracted, and the scattered nerve-cords reunited in a cone pointing downwards, from the apex of which the nerve passed under the muscle, compact and white again, and only differing from a healthy nerve in being a little tumid. The cyst was everywhere thin, and was for the most part connected with areolar tissue. It was composed of an external fibrous layer, which appeared to be the hypertrophied investment of the nerve, and of a glistening thin lining membrane. At one part it was attached to the external muscular portion of the gastrocnemius by white œdematous tough lymph. The muscle in this situation was paler than elsewhere, and had in it many circumscribed dots which resembled small trichinæ; while the adjoining portion of the tumour appeared to be composed of old tough white lymph, mixed with spots of red which gave it the appearance of the vascular or erectile tumours of muscle. These appearances were, however, deceptive; the dissection demonstrated the original connection of the tumour with the nerve. Under the microscope some of the trabeculæ in the cavity were found to be nerve-cords; these were near the nerve: others were fibrous only; these adjoined the muscle. No epithelial cells were seen, but a few small oval cells having indistinct nuclei.

Two vessels were found opening into the cavity of the cyst. One was a vein, of the calibre of the basilar artery, and nearly an inch in length, which opened at one end near the middle of the front of the cyst, and at the other end into a sural vein. Its course was upward from the cyst to the vein; but, although the direction of its channel corresponded with the ascending venous current of the limb, the mechanism of its two orifices favoured only the descent of blood into the cyst. For the extremity opening into the cyst was oblique, thin, and valvular, like the vesical orifice of the ureter, while the upper end was rigid and patent, being in a part where the sural vein was thickened and opaque. Moreover, there were no valves in the whole venous channel between the cyst and the popliteal vein. All the other vessels of the region were minutely examined, and one artery, about equal in size to the superficialis volæ, was found curving horizontally half round the upper cone of the cyst and beneath its fibrous tunic. It then projected for about one eighth of an inch into the cavity, and finally opened into it by a circular orifice. The only compact fibrin in the cyst was collected in the upper cone, where this artery opened. The most minute examination failed to discover the orifice of any vessel with which either the open artery or the vein could have been conterminous.

Remarks.—Encysted tumours, resembling that just described in two particulars, have occasionally been met with. They have been found filled with blood, and having corded and saccular walls, more or less like one of the cavities of the heart. But they have not been discovered in a nerve or communicating with vessels. In some of these, as in a large blood-cyst within the femur, depicted in Mr. Stanley's work on the bones, the wall may have been alternately sacculated and ridged by mere distension: in none has a normal structure been recognised crossing the cavity, as, in this tumour, isolated nerve-bundles stretched from end to end. The only case of a sanguineous cyst in a nerve with which I am acquainted is recorded by Bertrand in his 'Thèse de la

Faculté de Paris,' 1837, No. 220. It was as large as a hen's egg, and was found after death in the upper part of the right median nerve. The patient, a man æt. 80, had not complained of pain in it, and he had played the violin a few days before death. When cut into, there issued from the tumour "un flot de serosité sanguinolente, mêlée à des caillots de sang." Bertrand's description shows that in its form, in the thinness of its walls, and in its smooth internal surface, the tumour resembled that which is the subject of this paper; but he says nothing of isolated nerve-fibres in the cavity, or of the distension of its intermediate portions into sacculi, and he gives no account of the vascular source from which the blood had proceeded. Smith, in his great work on 'Neuroma,' refers to no instance of the kind but that of Bertrand.

Accordingly, this singular case receives no illustration from known diseases of the nerves. Most of the difficulties in it, however, were at once explained by the discovery of the cystic nature of the disease, and its relations to the popliteal nerve and to the vessels. A cyst in communication with vessels was in some manner formed in the interior of the nerve. The pressure of the entering current of blood progressively distended it, separating the nervous cords, and expanding even more into sacculated protrusions the thinner tissue between them. By continued distension some of the cords were at length isolated through the removal of the delicate connective tissue around them; and thus a resemblance of the interior of the cyst to an auricle or ventricle was produced, not by the growth of new tissue in the form of cords, but by the separation of the natural structures of the nerve from one another. This mechanism accounts for the form of the tumour, the progressive increase in the rate of its growth, its gradual fixedness as it filled the ham, the varying degree of its tension, the double character of the fluid which issued when it was punctured, the peculiar sudden anguish during that operation, the exquisite sensitiveness of the tumour, and the prominent distal pain which it produced, the freedom of the principal vessels of the limb from

connection with it, and the failure of remedies to cure or to arrest it.

The state of the contents of the cyst corresponded with that in which the vessels were found. By so small an artery fresh blood was but slowly introduced into the cavity. Its exit by the vein, though ready so long as the arterial and venous orifices were near together, became eventually difficult, and perhaps intermitting. For as the tumour increased, the outflow in a direction contrary to the valvular orifice of the vein may have been quite prevented; if, indeed, occasionally the stream rushing up the popliteal vein did not regurgitate along the easy channel into the cyst. It is even possible that, at last, the venous current may have pressed permanently into the cyst, as in the last month the enlarging tumour more and more hindered the escape of its own contents by compressing the popliteal vein, while at the same time the popliteal artery continued without obstruction. However this may have been, there could not have been any churning of the blood by the entering stream, as in an ordinary sacculated aneurism, or any passage of a rapid current through it, as in the case of a fusiform aneurism or of a large arterio-venous communication. The greater part of the contents of the cyst must have lain in a state approaching quiescence, which was only disturbed when the canula supplied a free outlet from the cavity. When the cyst was laid open and its pressure removed, the abundant venous hæmorrhage proved clearly enough that there could be regurgitation through the vein.

The origin of the tumour is chiefly obscure on account of its singularity. It must have begun in the nerve, being to the last entirely confined within the disparted nervous textures, but in its primary condition it may have been either a cyst or a ruptured vessel. The patient distinctly associated its commencement with the stroke of a piece of iron. If it originated in that violence, it could hardly be a cyst, for cysts do not so arise. It is, therefore, more likely that the primary lesion was the rupture of one or more vessels within the nerve. The growth of a cyst may indeed have preceded

the blow, and a vascular communication with it have been opened by that injury; but, as there had been no local ache before the accident, and the characteristic nervous pain was not established until several months after it, such an explanation is not probable. Neither is it credible; for a cyst is one of the rarest morbid productions in a nerve, and two such occurrences as a disease of that nature, and the violent opening of a communication between it and a blood-vessel, form a combination as unlikely as it is uncommon. The only conclusion remains that the entire disease resulted from the rupture of an artery and a vein together within the nerve at the time of the injury, and that it must be regarded as an arterio-venous aneurism. The smooth cyst-like character of the membrane lining the cavity, although unlike that of an aneurism, comports with the unusual conditions of the case. It was the result of the long duration of the disease and the unruffled quietude of its contents, which allowed of its organisation in the manner of any surface within the body which remains long free and undisturbed. The absence of pulsation does not render this even unlikely, for the quantity of blood which could be driven by so small an artery into a cyst, having practically no outlet, must have been less than would have produced an appreciable pulsation.

After these remarks upon the nature of the disease it appears unnecessary to argue as a doubtful question the propriety of amputating the limb. The tumour could not have been extirpated, and it must, after the closure of the bleeding orifices by ligatures, have been left to suppurate. But the inflammation preceding that process would have involved every separate fibre of the posterior tibial nerve, and occasioned an intolerable amount of suffering. Upon eventual mischiefs in the foot, in the popliteal vein which was adherent to the cyst, and in the many adjoining structures of the ham, it were superfluous to speculate.

A CASE

OF

MULTIPLE NEUROMATA

AFFECTING THE NERVES BOTH WITHIN AND EXTERNAL TO THE SPINAL CANAL,

SOME OF THE TUMOURS BEING OF A CYSTIC NATURE.

BY

SEPTIMUS W. SIBLEY, F.R.C.S. Eng.,

LECTURER ON PATHOLOGICAL ANATOMY AT THE MIDDLESEX HOSPITAL.

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The following case is submitted to the Society as being a remarkable example of the cystic form of nerve tumour. It is also an illustration of the extraordinary multiplicity which is sometimes observed in this form of disease. In most examples of the non-cancerous form of neuroma the tumour is composed of a solid fibro-cellular structure situated within the sheath of the nerve and more or less involving either a portion or the whole of the nerve-fibres. In a few instances cysts have been observed, but this is of rare occurrence. Among ten cases of neuroma recorded in the 'Trans. Path. Society' a cyst was observed in one only, and in this example the cyst was single and was partly filled with blood-clot.

James M—, æt. 45, a coach painter, was admitted into the Middlesex Hospital on April 9th, 1861, under the care of Mr. Henry. The patient was a man of slight make and fair complexion, and he stated that he had enjoyed good health till about seven years ago. At this period he became less strong, but had no definite symptoms to complain of till four years ago, when the use of his lower extremities became impaired, and by degrees he lost all power of movement. In the previous October a sore had formed on the back, which, after a short time, healed up, but others appeared in the same situation. When admitted into the hospital he had no power over the movements of the voluntary muscles in the lower half of the body. The legs were drawn up and firmly contracted on the abdomen. The position, however, of the lower limbs might be changed, and the legs would remain for a time if drawn down. His upper extremities were also bent, but he retained some power of motion, being at this time able to feed himself, his food, however, being first cut up. He was not able to hold a cup. Cutaneous sensibility was completely absent in the lower extremities, but the hands preserved an impaired and feeble sensibility. He had no power of retaining either urine or fæces. A large tumour was observed below the elbow, and another immediately below Poupart's ligament, on the left side. On the left buttock there was a deep sore the size of the palm of the hand, and there was a somewhat smaller one on the right buttock. Both these sores were sloughing.

After his admission into the hospital some improvement took place in his general condition; his appetite was good, and he was able to take food freely, although with some difficulty. For a time there was an improvement in the state of the places on the buttock, but subsequently the sloughing extended, and he died somewhat suddenly on May 11th, 1861.

The body was examined forty-nine hours after death, the weather being cold. The body was well nourished, there being more than half an inch of fat on the front of the

abdomen. In the left groin there was a firm tumour, the size of a large orange, closely connected with the anterior crural nerve, most of the fibres of this nerve being expanded over the surface of the tumour. On tracing up the nerve a second tumour, the size of a pigeon's egg, was found, attached to one of the branches of the lumbar plexus, close to the spine. This tumour contained a cyst. On the same nerve, within the spinal canal, was another tumour, the size of a hazel-nut, pressing upon the cord.

On the right arm, below the bend of the elbow, was a firm lobulated tumour, the size of an orange. The section of the tumour was translucent. No nerve was traced connected with it.

No disease was discovered in the internal organs. The liver, spleen, and kidneys were somewhat flabby and soft.

The membranes of the brain were extremely congested, but the brain-substance and also the cerebral nerves were healthy.

On laying open the membranes of the cord a vast number of nerve tumours of various sizes were exposed. These were chiefly seen in the upper cervical and in the lumbar regions. In the cervical region several neuromata were observed, and the principal of these was a tumour the size of a large nut, situated opposite the second or third vertebræ. This tumour was placed within the membranes of the cord; it was of a rounded form. From the position of the tumour it had pressed upon the spinal cord, which was found much constricted and softened opposite the tumour, but the cord above and below the tumour presented its ordinary appearance. This tumour was of a cystic nature.

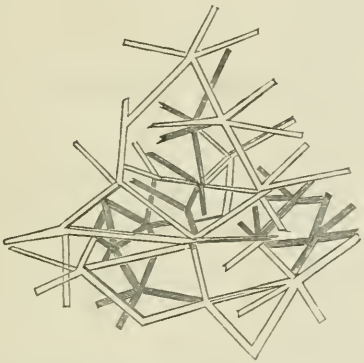
In the lumbar region the number of neuromata was very great, they were chiefly situated within the membranes of the cord. The tumours were very various in size, and in several instances arranged on the nerves in such a manner as to give the appearance of a number of beads strung on a string. Most of these small tumours were either globular

or ovoid, but in some instances the surface was nodulated like that of a mulberry.

The large tumour on the crural nerve was examined more minutely. It was found to be enclosed in a dense fibrous capsule, which could be with very little difficulty removed from the surface of the tumour. The capsule was continuous with the sheath of the nerve. A section being made the tumour presented the appearance of a fibro-cellular tumour interspersed with cysts, the fibrous portion being chiefly collected in one part and the cystic portion in another. The fibrous portion exhibited the appearance, usually observed in neuromata, of fibrous bands arranged parallelly to the surface of the tumour. The cysts were very various in size, some being very minute and almost microscopical, and others considerably larger, one being as large as a hen's egg. All the smaller cysts were filled with clear serous fluid, the cysts being formed by a thin smooth fibrous wall. The tissue between the cyst-walls was fibrous. The largest cyst was nearly filled with partly organised blood-clot. The coagulum, still retaining the colour of blood, was in most places adherent to the wall of the cyst. Portions of this blood-clot were much paler than the rest of the coagulum. A second cyst, the size of a walnut, was filled with yellowish gelatinous or colloid substance. This material was slightly adherent to the wall of the cyst, but did not present any appearance of blood-clot to the naked eye.

On microscopical examination the solid portions of the tumour were found to be made up of the ordinary wavy fibre-tissue with a certain proportion of cell-nuclei and of fibre-cells. The blood-clot exhibited the characters of coagulum in various stages of organisation. Portions were composed almost entirely of an agglomeration of blood-corpuscles and of granular material. In other portions, the same appearances were found mingled with straight fibrils passing in various directions. In other parts again, the fibre-structure predominated, the tissue being composed of straight fibres arranged more or less in the manner of

stellate tissue, the spaces between the fibrils being filled with granular matter and a few blood-corpuscles. A microscopical examination of the colloid substance contained in the smaller cyst proved that it was of a like nature to the last described. It was composed of the fibrils arranged as stellate tissue, supported apparently in a transparent fluid or semi-fluid, which contained a few blood-corpuscles or nuclei scattered through it.



Colloid substance from the interior of the cyst.

I have to thank Mr. Henry for the opportunity of studying this case, and of bringing it before the Society.

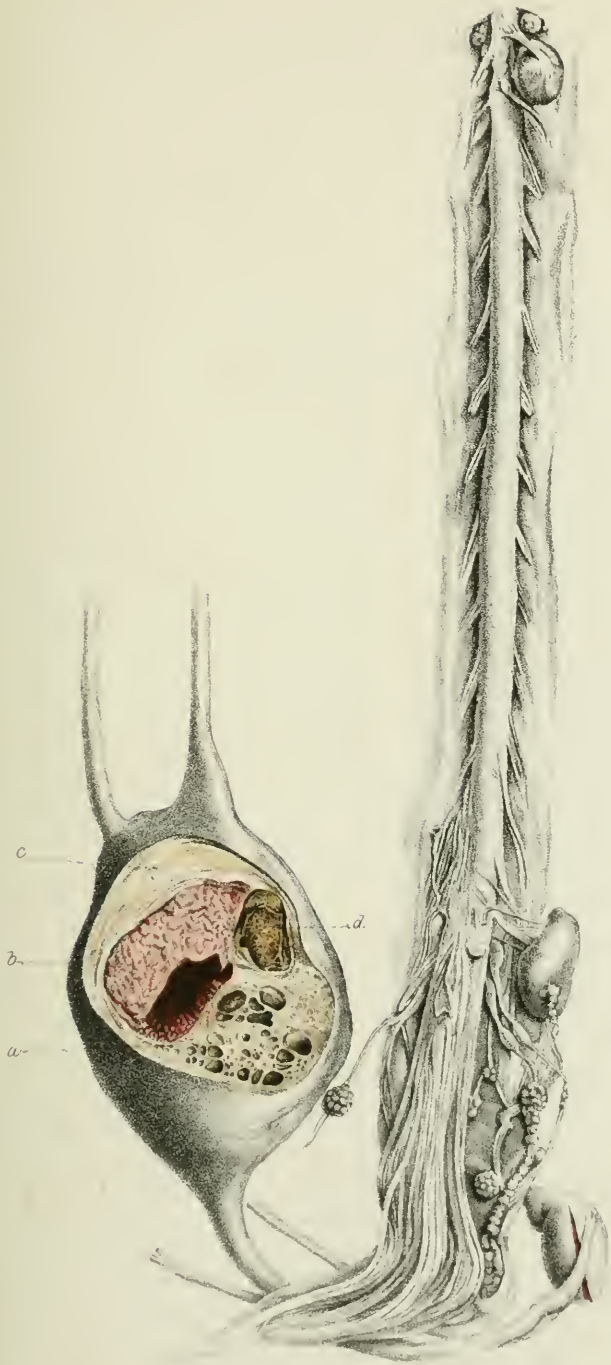
DESCRIPTION OF PLATE I.

The drawing exhibits a general view of the spinal cord, with the principal nerve, as it appeared when removed from the body.

The lower portion has been turned round so as to enable it to be shown on the same plate.

The component parts of the large tumour are:

a. The cystic portion.
b. A cyst filled with blood-clot.
c. The fibro-cellular structure forming the solid part of the tumour.
d. The cyst filled with jelly-like substance.



Linear dimensions about $\frac{1}{2}$ of natural size.

F. Burgess del. et lith.

ON

GRANULAR DEGENERATION OF THE VOLUNTARY MUSCLES.

BY

EDWARD MERYON, M.D. F.R.C.P.

Received Feb. 22nd.—Read Feb. 27th, 1866.

In 1851 I had the honour to communicate to the Royal Medical and Chirurgical Society the details of a case which, after careful microscopic investigation, I ventured to call *Granular Degeneration of the Voluntary Muscles.* The French have denominated it *Atrophie Musculaire progressive.* Since that time two other cases have fallen under my observation, in each of which I scrutinised, with great care, the different tissues of the body; but I would refer to one in particular, which was for a long time under the care of my friend Mr. Skey, and the *post-mortem* examination of which Mr. Savory kindly superintended. In it there existed the same breaking up of the sarcolemma of the elementary primitive muscular fibres, and a segregation of the granules of which the sarcous matter is composed, as in the case described in my former communication; therefore I still adhere to the term granular degeneration, for it is not a simple atrophy or attenuation of the muscular fibre, but an absolute destruction or disruption of that tissue, and if any other name were given it, I think that which has been

suggested by Shultz would be the best—namely, *Necrobiosis of the Voluntary Muscles.*

H. D. C. Delamotte, Esq., a surgeon at Swanage in Dorsetshire, has a family of fifteen sons and daughters. Of the first six, by one mother, there are three sons and three daughters, all strong and healthy. The second portion of the family consists of five sons and four daughters, and the eldest daughter and son, aged respectively 24 and 22, are now the subjects of the disease in question; all the others are perfectly healthy.

Mr. Charles Delamotte, who has kindly consented to be here this evening, was showing symptoms of weakness in the legs when I first saw him in June 1855. His sister had then been affected three years, and walked with considerable difficulty.

The first symptom which manifested itself in both Mr. and Miss Delamotte was a sense of weakness referred to the loins, so as to cause a waddling gait; next, a difficulty in bending the thighs on the body, as in the act of getting up stairs; then a gradual diminution of the power of raising the legs towards the thighs; and, eventually, the feet and toes participated in the paralysing influence.

The period of time during which these successive stages of the disease run their course varies in different individuals. In Mr. Delamotte's case it has been very much prolonged by his perseverance in exercise: but in all the course is progressive and unyielding.

After the legs have been rendered thus useless the upper extremities begin to exhibit the same centrifugal morbid action. I hear that Miss Delamotte, whom I have not seen since 1855, has lost all voluntary motion of her arms and hands; her brother, however, has still a firm grasp of the hands, and is able to bend the forearms on the arms, but he cannot raise his arms to his head. He now amuses himself by rowing, and thus continues the exercise of his upper extremities.

From neither parent is it possible to trace anything like hereditary predisposition, and in both the patients the in-

firmity has appeared and progressed without any other assignable cause. Both cut their teeth easily, and each one passed through the period of childhood without having had fits of any kind, nor was either considered to be nervous. The young lady began to menstruate at the early age of fourteen, and menstruated regularly; she never had leucorrhœa; and when I saw her she had a remarkably healthy appearance, a ruddy complexion, well-developed limbs, and good intellectual power. Her tongue was clean, her appetite good, her bowels regular, but her pulse was somewhat weak and quick (108).

Her brother also gives an excellent account of his general health. He has never indulged in pernicious habits, he has never exposed himself to influences likely to become the source of disease, nor has he ever been the subject of any other cause of weakness. He has always slept well at nights, his appetite is good, his digestion good also, his bowels are regular, and his sexual feelings, he supposes, are like those of other men. His pulse, like his sister's, is somewhat weak and quick. Notwithstanding the inactive condition of his legs he never suffers from cold, and the skin retains its healthy warmth and sensibility.

The peculiarity of the disease in these cases is that it is *not* apt to be accompanied with symptoms of nervous disturbance; and from the researches I have made, I am induced to believe in an idiopathic disease of the muscles (dependent probably on defective nutrition) akin to that to which the bones are liable, from the same cause.

In the Thirty-seventh Vol. of the Society's Transactions, Dr. T. K. Chambers has recorded the case of a female, æt. 26, in whom mollities ossium and granular degeneration of the muscles co-existed. This patient had gradual increasing weakness of the muscles without any pain being experienced at any time. In my treatise on paralysis I have also referred to a case in which both muscles and bones were affected, and apparently in consequence of defective nutrition, but without pain; and the singular absence of every indication of nervous disturbance has obtruded itself on my

mind during the progress of most of the cases of granular degeneration of the voluntary muscles which I have seen.

Mr. Delamotte assures me that throughout the whole course of his infirmity he has had neither ache nor pain. Neither has he at any time experienced the quivering or starting of the diseased muscles which M. Cruveilhier described in the case of Prosper Lecomte, in which the anterior roots of the spinal nerves were affected.

Most pathologists, however, are disposed to attribute to some lesion of the nervous centres these extraordinary cases, and I have often felt a desire to discover a central nervous cause for what we have all been taught to regard as indispensable for such effects. Yet when a paralysis extends in a centrifugal direction, respectless of the course and distribution of nerves; when there is an entire absence of any one symptom of nervous disturbance; when, moreover, such men as Quekett and Savory have failed to detect in such cases the slightest change from the healthy condition, either in the peripheral nerves or in the nervous centres; surely it is not discordant with a sound physiology to suppose that there may be a destruction of muscle, independent of nervous origin; and that the symptoms which I have described may distinguish it from those cases in which manifest nervous symptoms appear during life, and in which lesions of the nervous centres are found after death.

If, then, the disease in question consists in an alteration in the composition of the muscular tissue, are we encouraged by the most recent researches in biology to hope that, by any remedial agent, a formative change may be effected, that the cell constituents of the affected muscles may be incited to healthy action, and that new sarcous substance may be reproduced in the primitive muscular fasciculi?

Thus far the disease has pursued, as I have already stated, a progressive, unyielding course; but Mr. Delamotte affirms unhesitatingly that during the last year his symptoms have, under the influence of Fowler's solution, made very much less progress than they have done during the course of any preceding year.

The accompanying illustrations are taken from the muscles of the Hon. Wm. P—, who suffered from an affection identical with that of the subjects of the present paper, and whose case is described in the thirty-fifth volume of the 'Transactions' of this Society, p. 77.

DESCRIPTION OF PLATE II.

FIG. 1. Rectus abdominis. ($\frac{1}{8}$-lens; low eyepiece.)

2. Spinalis dorsi. (ditto.)

3. Pectoralis major, clavicular portion. (ditto.)

4. Longissimus dorsi. (ditto.)

5. Pectoralis major, sternal portion. (ditto.)

Fig 1

Fig 2

Fig 3

Fig 5

Fig 4

NOTES AND OBSERVATIONS

ON

FEVER

DURING SERVICE ON BOARD HER MAJESTY'S SCREW-CORVETTE PYLADES, OF 21 GUNS,

ON

THE WEST COAST OF MEXICO, IN THE YEAR 1860.

BY

JOHN CADDY, M.D., Surgeon R.N.

COMMUNICATED BY THE LATE

THOS. HODGKIN, M.D., &c. &c.

Received Jan. 3rd.—Read March 13th, 1866.

The Pylades was of 1275 tons burden, of 350 horse-power, carrying an armament of eight-inch guns on the upper deck, and had been commissioned in 1857, at the outbreak of the Indian mutinies, for the East Indian Station, with a complement of 260 officers and men.

The first important service was at Calcutta, during the hot and the rainy seasons of 1858, the officers and the ship's company passing through a very sickly and trying period. Very opportunely, the Pylades left the river Hooghly in

November of this year for Vancouver's Island, the ship arriving on the 14th of February, 1859, at the beautiful land-locked harbour of Esquimalt, surrounded by its fine forests and snow-clad scenery. The change to this bracing northern climate proved most beneficial in every way. The ten months passed at Vancouver's Island witnessed a marked improvement in the general appearance of the ship's company, the climate of this hitherto but little frequented region proving most useful to the men who had been recently enfeebled by East Indian service. Vancouver's Island presents similar advantages to ships of war from the tropical parts of the Pacific sea-board, and its anchorages, having no ice barriers, are accessible at all seasons.

The following statistical statement is in illustration of the fever cases of the Pylades on the West Coast of Mexico in 1860.

Diseases.	Added to sick list.	Ditto to duty.	Died.	Unfit for active service.	Cases and days' sickness between certain ages.											
					15 and 25 years.			25 and 35 years.			35 and 45 years.			45 and 55 years.		
					No. of cases.	Days' sickness.	Average days on sick list.	No. of cases.	Days' sickness.	Average days on sick list.	No. of cases.	Days' sickness.	Average days on sick list.	No. of cases.	Days' Sickness.	Average days on sick list.
Fever, Continued ...	153	147	1	5	94	1441	15·25	37	381	11·1	16	285	17·13	6	74	$12\frac{1}{3}$
Fever, Remittent .	9	9	—	—	6	46	$7\frac{2}{3}$	2	17	$8\frac{1}{2}$	1	21	21	—	—	—

General Abstract of the Sick List.

Cases added to the sick list in the year.	Discharged to duty.	Died.	Unfit for active service.	Total days' sickness on shipboard.	Daily average of each case on sick list.	Mean numerical strength of ship's company.
518	504	2	8	6448	12·4	225

Mean Proportion of all Ages on Board.

Between 15 and 25 years.	Between 25 and 35 years.	Between 35 and 45 years.	Between 45 and 55 years.	Total.
134	55	29	7	225

The disposition to febrile attacks was most observable, within the tropics, with the advent of rain and increased heat. The proclivity at different ages to fever and other illness has its etiological import. The statistical abstracts, from their limits, do not yield any very extended and practical inferences, but have their value as furnishing connecting links with other observations. Between twenty-five and thirty-five years of age appeared the most able period for active service. In advance of these ages convalescence proved more tedious, and the liability to febrile attacks increased; but this tendency was much influenced by previous tropical service. The higher per-centage of fever attacks was due in part to relapses, also to the accidental circumstances of some patients being long on the sick list, thus giving a greater number of days' sickness to the cases under treatment; the number of days that the men were on the sick list was no doubt influenced by the fact of being on an alien coast, where, without the ship, there were no available hospital resources. The actual attacks of fever which a service career may precipitate do not represent the chronic illness which too often follows, in broken health and premature old age.

The seasons on the West Coast of Mexico are the periodical "dry" and "rainy." These extend from Mazatlan to Panama. But little rain is yearly looked for at La Paz and at Guaymas, but in these positions it does fall in torrents, years intervening between these visitations. The geographical situation of La Paz and of Guaymas, the physical features of these sun-dried districts, and the absence of paludal exhalations, are not in favour of the prevalence of fever.

The climates of Mazatlan and of San Blas have many features in common, the latter port being only two degrees south of the commercial roadstead of Mazatlan. The most healthy season at these places is during the dry weather, from October to May. The wet season is looked for between the months of June and September. At Panama, which is eight degrees north of the equator, there are usually showers throughout the year, and in the months of

July, August, and September, it rains nearly incessantly. In these intertropical localities, possessing their coast belts of low land, and their mangrove-sided rivers teeming with the rankest vegetation, fevers will prevail during the rains, but principally at their commencement and their termination. If the dry season is much prolonged into the months of July and August, the solar rays being screened by no clouds, the first sudden fall of rain will probably introduce fevers of a very severe type. Such was the fact at Mazatlan in September, October, and November, 1860. The Pylades, being at Guaymas, with the advantages of dry weather, escaped the long-expected rains at Mazatlan and the attendant sickly season.

The Pylades arrived at Mazatlan the 2nd of January, 1860, direct from Vancouver's Island. It is within the tropics, and is the largest commercial port on the coast under notice. The ship, the last day of this year, was in the Gulf of California.

There was a trip made to Panama during the months of February and of March. In returning, coals for steaming purposes were replenished at Acapulco on the 7th of April, where we found the yellow fever prevailing and very fatal. At this period yellow fever had been unknown on the coast north of Acapulco.

The first warning of being in the Mexican tropics, with the attendant increased heat and moisture, were some few cases of remittent fever. Some of the earlier symptoms were very distressing to the patient—an abdominal pain, perhaps a diarrhœa, was superadded. The usual symptoms, when the patient was first seen, were vertigo, epigastric and lumbar pain, frontal headache, a pulse quickened and compressible. The skin open and perspiring freely, but frequently cold and clammy. The face was flushed, and the features assumed a contracted appearance. Such were the prominent symptoms of some cases which yielded to treatment. It was sought to explain their origin from causes without the ship. The ship's company had leave at Mazatlan in January, many of the men committing excesses. But in

the great majority of those on the sick list I could not associate the prevailing sickness with any marked acts of dissipation.

A case of continued fever presented itself on the 21st of February, five days before reaching Panama, from which date up to anchoring at San Blas, the 14th of April, there were 35 additional cases of the same type of fever.

The duties of provisioning, receiving coals, fitting a new steam-funnel, refitting the ship, &c., involved much unavoidable solar exposure. The protection of British interests called for the presence of a man-of-war at San Blas, where the Pylades remained up to the 21st of June. This service lasted a period of 68 days. Officers, seamen, and marines, were landed, taking alternate 24 hours' duty at San Blas, being relieved by a corresponding force from the senior officer's ship Amethyst, of 26 guns. From this duty the officers and men of the Pylades were withdrawn the 28th of May, having been 38 days on this service.

The deteriorating agencies here at work were—disturbed night's rest from the attacks of sand flies, the excessive use of bad brandy, and exposure to the unclouded sun's rays. It was during this service that 45 cases of fever were added to the list. Towards the latter end of May, with increased heat of the weather, there was a sudden addition to the sick list. In the hotter month of June the usual rainy season near at hand exhibited more numerous attacks of fever.

Between the 24th of June and the 22nd of September there were 53 other cases of fever, the Pylades making the short passages to and from the anchorages at Mazatlan, La Paz, and Guaymas, and being at anchor 48 days at divided periods off the fever districts at Mazatlan; but from motives of prudence no general leave was given the ship's company at Mazatlan, having within reach at La Paz and at Guaymas more eligible localities for recreation open to them.

From the 27th of September to the 26th of December the Pylades was at Guaymas, profiting by the agreeable change there experienced from the hot summer winds to the cold season, commencing in November; these climatorial changes

being yearly looked for high up the Gulf of California. The men's health improved, there being only 8 other cases of fever, in which a catarrhal tendency was observed, easily controlled by treatment.

In a patient seen when threatened by an attack of fever the general symptoms observed were usually vertigo, disturbed rest, nausea or actual vomiting. Perhaps a rigor would be succeeded by hot sweating, thirst, and general lassitude; the pulse would be much quickened, but compressible; the skin usually hot and open; the tongue loaded and moist; the bowels and kidneys acting. Frontal headache, with increased heat of this part; lumbar pain, or aching; perhaps pain of the legs. These symptoms would usually usher in an attack of the prevailing type of fever.

If the case of fever was more highly developed, the patient complained much of giddiness, of severe frontal headache, sometimes involving the vertex and occiput, with increased heat of the cranium. Fits of epigastric pain, occasionally descending to the umbilical region; general pains of the limbs. In a few cases there was pain extending up the course of the spinal column to the occiput, the face becoming flushed and covered with a beady perspiration, sometimes giving the appearance of being half drowned in hot water, or, more rarely, the skin warm, but clammy. Restlessness, with attempts at sleep, but no refreshing rest. A milk-white, moist-looking tongue, with tremor on its protrusion, or presenting more rarely a reddish glazed appearance, in such cases usually presenting a tobacco-coloured coating at its base, extending down the mesian line to near its apex. The pulse much quickened, but compressible, rarely bounding; if so, only for the first forty-eight hours, denoting vascular excitement with nervous prostration. There was usually intense thirst, with a craving for acid drinks. The bowels were rarely constipated, but frequently there was diarrhœa; the excretion of urine was not diminished.

In the very great majority of cases that progressed favorably there would be, within the first three days after

being put on the sick list, less of heat of skin and of diaphoresis; less frontal headache and lumbar pain; the pulse less quickened, still compressible, but of steadier volume; the tongue cleaning; daily evacuations of urine and fæces; a coming relish, in small quantities at a time, for animal soup, wine, and farinaceous food:—such would be the ordinary course to a safe convalescence. Usually within the first week of treatment (excepting a lumbar weakness or chronic pain, and a general debility, much felt in the erect position) there would be nothing in the patient's case for solicitude as to its favorable termination.[1]

Some few cases in the course of treatment were associated with much collapse; the stomach would become on a sudden very irritable; sordes would collect on the teeth; the features would put on a choleraic reddish-leaden hue; the tongue would be cold, dry, with a tendency to brown; the skin would be covered with a chilly, clammy, profuse sweat; the pulse weak, quickened, the intervals very short; some little dyspnœa, or irregular and laboured breathing. In some few other cases a very severe accession of frontal headache would be the prominent complaint, and usually augured a tedious convalescence. In some instances there were involuntary evacuations of urine and fæces, and incoherent muttering. If delirium set in it was never of long continuance, and was of rare occurrence.

Symptoms of irregular periodicity of varied severity appeared in cases not convalescing in the usual way. At the commencement of an attack of fever the patient's prominent allusion to a severe headache involving the entire upper surface of the cranium, or this symptom suddenly developed after some days of treatment, was often much dwelt on, and was not easily relieved. It would be, perhaps, accompanied with occasional chills and profuse clammy sweating.

[1] Dr. Musgrave, of Antigua, writes—"In comparing a mass of cases occurring in town and country with Creoles and Europeans, a continued chain could be traced, link by link, from the most concentrated form, as it invades new comers, to the simple intermittent which we frequently meet with among the slaves."—Vol. ix, p. 123, 'Med.-Chir. Trans.'

This symptom did not warrant the inference of the existence of meningitis. Yet the often enfeebled state of the vital powers prepared me for the possible contingency of cerebral effusion by exosmosis supervening on congestion.

Debility was very frequently and prominently complained of after the first relief of the acute febrile symptoms, which usually took place within the first three days of treatment. The patients would often report themselves as feeling a little faint, with a sensation of trembling in the abdomen. In but few instances was the lemon tint of the surface seen, and then only in a modified degree. One lad was afflicted with periostitis of the left humerus, after the subsidence of fever, followed by exfoliation of bone. Dyspnœa and a feeling of suffocation were not often complained of, and with the first reaction there was very rarely a return of these symptoms. As an occasional complication, acute thoracic pain, with a marked periodicity in its recurrence after the first ardent febrile symptoms had subsided, gave its difficulties in prognosis. How far the pericardium was involved in such attacks was not easy to determine. At other times a periodic pain would localize itself in the region of the liver, but more frequently in the vicinity of the spleen. In a few instances hemicrania was encountered. In one case there were periodic pains in the right lumbar region, but not traceable to disordered function of the kidneys. These sequences of fever mostly harassed patients by night. In a few cases a furious watery purging alternated with a prolonged horripilatio, and perhaps actual rigor. Intestinal pain was met with at intervals throughout the course of the majority of cases.

Numbness of the lower extremities was noticed in some protracted cases. Constipation in one case was the precursor of complete paraplegia below the knee-joints in the second week of fever. In another case there was a spasmodic irregular action of the colon, some uncoagulated florid blood being passed, alternating with occasional constipation. This was the only fatal case of fever that occurred; the subject was a seaman between thirty and forty years of

age. He died in the third month of illness, in a state of distressing debility.

In only one instance, at San Blas, did I suspect the presence of black vomit. The ejected contents of the stomach being mixed with dirty water and other refuse, nothing decidedly diagnostic could be arrived at. As the vomiting in this interesting case did not again appear, there was no opportunity of pronouncing on the question of black vomit. It is due to record, from all inquiries I made at San Blas, Mazatlan and Quaymas, that "black vomit" (el vomito prieto) was unknown in the fevers of these commercial towns.

The treatment of the sick in fever committed to my charge I feel to have been most successful. I secured fresh breathing-air by a removal to the upper deck, when the heat and closeness of the men's sleeping deck became oppressive to the sick. Personal ablution was enforced for the double purpose of cleansing and cooling. The hair of the head was close cut. The fullest supply of cooling drinks was permitted, either of lemonade with chlorate and nitrate of potash, or of nitro-muriatic acid and water, the mineral acids being preferred to relieve the thirst attendant on profuse diarrhœa. The most urgent symptoms were immediately attended to. The head was quickly cooled by pouring sea water over it, giving the sensation of coldness to the hand of the by-stander. A sedative effect was thereby produced, which would last, perhaps, two or three hours. If the surface of the body was covered with a profuse hot sweat, the patient was washed with soap and cold water, varied by ablution with a little vinegar and water. If the sweating was chilling and clammy, warm ablutions were indicated and freely used. In some instances, where there appeared but little tendency to reaction, with a loaded tongue, an emetic of half a drachm of ipecacuanha, with twenty grains of the sesquicarbonate of ammonia, was early given. Constipation was not frequent either at the commencement of the fever or in the course of its treatment. There was often, with patients when first seen, diarrhœa with abdominal pain, which it was expedient at once to relieve; and purgatives, excepting in a few instances,

were not admissible, the patients not bearing the attendant depression. Mustard sinapisms, chloroform liniments, dry cupping, and blisters, had their uses for the relief of lumbar or abdominal pain and head symptoms.

In the treatment of fever the sesquicarbonate of ammonia in conjunction with the chlorate of potash was early given, in from ten to twenty grains of each, with lemon juice, three or more times in the twenty-four hours. The employment of ammonia was suggested from a West Indian experience at the Royal Naval Hospital, Jamaica, between the years 1845 and 1847, from observing that the fatal cases of climatic fever usually terminated by cerebral and spinal effusion. At Calcutta, in 1858, I had to notice the very sudden end to cases of fever by serous apoplexy. This tropical experience pointed to ammonia as a very valuable medicine, from its known property in preventing coagulation of the blood, and from its action in stimulating the heart and arteries without unduly exciting the brain. If diarrhœa with abdominal pain were present, laudanum and antispasmodics were given in conjunction. If the purging and cold sweating were very severe at the onset, the acetate of lead and Dover's powder, brandy, and arrowroot, were called for. Counter-irritation was applied; the bowels quieted; the ammonia and chlorate of potash were given with opium. The ammonia treatment was persevered in with the usual good results, the pulse becoming less frequent, and of steadier volume; the tongue cleaner, with the relief of hot or clammy sweating; less frontal headache; and refreshing sleep. Regular evacuations were established from the kidneys and bowels; a little castor-oil with grey powder producing full bilious stools.

With the cessation of active symptoms—debility and lumbar pain or weakness alone being complained of—quinine and iron usually and speedily concluded the treatment of the cases. Sometimes a little chronic diarrhœa required at this period to be arrested by the nitro-muriatic acid with laudanum. In those cases in which periodic pains followed the stage of debility secondary means were needed.

A good animal soup was early given, with wine or other

stimulant; in the period of convalescence the best dietary was administered that could be relished and digested.

These observations on the treatment of fever mainly with the ammonia and the chlorate of potash have the material advantage of being confirmed by my experience during a ten months' service in the Gulf of Mexico in 1862, as surgeon of Her Majesty's screw-frigate Phäeton, during the Anglo-French and Spanish mediation in the affairs of the Mexican Republic, when the total fever cases for the year were 209.[1] In 1863 I had a further ten months' experience amongst the West Indian islands, confirmatory of the ammonia treatment; the total fever cases in this year on board the Phäeton being 109. Such is the value I attach to this agent that I now never feel any security in the treatment of tropical fever until the blood has been more or less saturated with the volatile alkali, after which quinine, singly or in combination with iron, cannot be dispensed with.

[1] In 1862, with an average complement of 509 officers and men on board the Phäeton, there were added to the sick list 1146 cases, and the total days' sickness of these cases were 11,124. There were sent to hospital 20 cases; 5 deaths on board; 38 sent home as unfit for active service on the station; discharged to duty, 1108. With the 209 fever cases in the year, there were 24 of cynanche tonsillaris; of diarrhœa, 101; of erysipelas, 7; of phlegmon, 113; of abscess, 71; of ulcer, 105; of whitlow, 3. The seamen and marines in the year were 237 days on salt provisions.

In 1863 the average complement was 459, when there were added to the sick list, 812; the total days' sickness were 7323. There were sent to hospital 32; 5 deaths occurred; 15 were reported unfit for active service and sent home; 772 returned to duty. Of the 109 fever cases, 72 were recorded as ephemera; of diarrhœa, 117; 1 of erysipelas; 56 of phlegmon; 46 of abscess; 37 of ulcer; 7 of whitlow. The seamen and marines were 149 days on salt provisions.

In 1864 there were 80 cases of ephemera; 6 of continued fever and 8 of intermittent; 20 of cynanche tonsillaris; 80 of diarrhœa; 5 of whitlow; 45 of phlegmon; 48 of abscess; 25 of ulcer; 5 of erysipelas. The total additions to the sick list were 721; 3 deaths occurred; 41 were sent to hospital; 5 were unfit for service and sent to England. The total days' sickness were 5533. The Phäeton, this year, was stationed at Bermuda, at the Hampton Roads, (Virginia), and in the Gulf of Mexico. The seamen and marines in the year were 169 days on salt provisions.

In vessels of war, where large numbers of men are living much under the same hygienic conditions of breathing-air, dietary, and solar heat, it will be found that there is with fever cases much allied zymotic illness evidencing low vitality.

Of the 518 cases of sickness in 1860, in the Pylades, on the west of Mexico, there were ten cases of cynanche tonsillaris; 36 cases of diarrhœa; 28 of ulcer; 58 of abscess; 14 of phlegmon; 1 of erysipelas; 3 of whitlow. These cases, with the 162 of fever, yield a total of 312. Of accidents, there were 94, so that 112 cases in addition conclude the sick list of 518. A pathological classification of blood ailments I have found practically useful in suggesting similar constitutional treatment, especially in diarrhœa, erysipelas, and acute cynanche. The health of men on shipboard and of a community on shore is to be easily judged of by the prevalence of diarrhœa and by the existence of purulent integumentary affections. They are collectively nature's efforts at elimination, and the general precursors and companions of the fever lists on board Her Majesty's ships and vessels of war in all quarters of the world.

A CASE

OF

LUMBAR COLOTOMY

(AMUSSAT'S OPERATION)

SUCCESSFULLY PERFORMED FOR THE RELIEF OF A VESICO-INTESTINAL FISTULA.

BY

T. HOLMES, M.A. Cantab., F.R.C.S.,

SURGEON TO THE HOSPITAL FOR SICK CHILDREN, AND ASSISTANT-SURGEON TO ST. GEORGE'S HOSPITAL.

Received Jan. 2nd.—Read March 27th, 1866.

The following case bears a considerable analogy to one published in the 33rd volume of the 'Transactions' of this Society, in which Mr. Pennell, of Rio Janeiro, operated with success upon a patient in whom a very large communication had formed between the rectum and the urinary tract, allowing of the passage of large substances into the urethra from the rectum, and of the discharge of all, or nearly all, of the urine into the gut. In that instance the patient laboured under stricture both of the rectum and of the urethra, and the latter disease had resisted all endeavours

to pass an instrument. In the case which I am about to relate, no such complication existed; the bladder was perfectly healthy, except for the irritation caused by the fæces passing into it: the disease was evidently seated in the intestine, and was to be dealt with, if at all, by measures directed to the intestine. I was not, at the time, aware of the occurrence of Mr. Pennell's case; but the symptoms were so urgent, and the man was so anxious to obtain relief, at the expense of any operation that could be recommended to him, that the treatment pursued by Mr. Pennell was almost irresistibly suggested, although there was no perceptible stricture of the intestine, as was the case in Mr. Pennell's patient.

In the following paper I shall first give a short account of the case of my own patient, and then refer to a few similar recorded instances of communication between the bladder and some part of the bowel. More, of the same kind, might, no doubt, be discovered by a search through museums and books: but the catalogue would be somewhat wearisome; and those which follow will, I hope, be sufficient to establish the three following points, viz.:

1. That ulcerated openings sometimes take place between the bladder, and either the large or small intestine, many of which have no connection with previous stricture of the gut, still less with cancer:

2. That in those cases in which the fæces discharged into the bladder come from the lower gut, and are consequently more solid, great suffering is produced, and the formation of calculus in the bladder becomes exceedingly probable:

3. That in such of these cases as are not dependent on malignant disease, colotomy, by diverting the fæces from the fistulous channel, may enable the latter to close, and thus relieve the patient's sufferings, and restore him to a condition of health and of comparative comfort.

Before entering on the particulars of the case, I ought to state that the patient was under the care of my friend Mr. Faithorn, of Chesham, to whom the original suggestion of the operation is due; and to whose kind assistance I was

much indebted during the operation, and for the success of the after-treatment.

Case.—John B—, æt. 51, a shoemaker, small and of spare habit, had been suffering under symptoms of obstruction of the bowels for more than four years. It did not appear that he had ever been examined surgically during the earlier part of that time. At a recent period, it was said that his rectum had been inspected by means of a speculum, and that a tumour had been brought into sight. About three months before I was called to see him, the first symptoms of ulceration into the bladder occurred. They were preceded by pain, referred to the pelvis; then flatus, and, lastly, fæces, passed from the urethra. The quantity of fæces had so greatly increased, that he now experienced very great difficulty in unloading the bladder. The operation of micturition took him a very long while, as he was obliged, as it were, to milk the fæces out of the urethra. He was in great pain and distress, and was losing flesh rapidly; but this appeared the mere effect of the local disease, for his general health was otherwise satisfactory. Examination of the parts showed but little. There was no difficulty in passing the catheter. There was no unnatural sensation in the rectum, so far as the finger could reach; nor could Mr. Fairthorn and myself discover the tumour which had been said to be in sight through the speculum. On this account, we could not help feeling some little doubt as to the locality of the perforation in the wall of the intestine, as it might possibly proceed from adhesion between a coil of small intestine and the bladder. However, the persistent symptoms of obstruction, together with the uninterrupted good health that the patient had enjoyed previous to the formation of the opening into the urinary tract, appeared inconsistent with disease high up in the canal; and the matters discharged by the urethra resembled the contents of the large intestine.

It might have been possible to obtain some information as to the seat of the obstruction or perforation in the bowel

by filling it with fluid. This measure, however, seemed somewhat hazardous, in our entire ignorance of the nature of the parts surrounding the opening in the gut, since any considerable distension of the bowel might have had a disastrous effect in tearing the ulcerated portion. The urine had passed for several months partly per anum, which again was a strong argument for supposing that the opening was low down in the intestine; so we decided to act upon the assumption that the opening was in the lower part of the large intestine; and, as the man was anxious to submit to any operation which would give him a chance of relief, it was agreed to open the descending colon. I anticipated a good deal of difficulty in the operation, since there was no distension of the bowel—on the contrary, the fæces seemed to be continually escaping; but the same reflection which led us to abandon the idea of injecting a quantity of fluid into the gut with a view to diagnosis, also deterred us from adopting the same measure with a view to distend the colon; viz., that as we did not know the position or state of the ulcerated opening in the intestine, it would be hazardous to do anything which might cause a laceration of its edges.

On June 17, 1865, I proceeded to perform Amussat's operation, under chloroform. Considering the small size and spare habit of the patient, a great mass of muscle had to be divided before the sub-peritoneal tissue was reached. After the division of the muscles, a shining, serous-looking membrane came into view, but was easily known from peritoneum by its position with respect to the kidney (the end of which could be felt above it), and the fat which was seen shining through it. It was at first impossible to find the gut; but, after a careful search, the colon was recognised, lying close upon the spine. The position of the gut was ascertained by means of two small masses of fæces which were felt in it. It was then drawn to the surface with a pair of dressing-forceps, secured by sutures, and opened pretty freely; no fæces or air escaped. The finger passed downwards into the gut from the opening did not come upon any tumour or other evidence of disease.

When he was next seen, about an hour after the operation, nothing had passed from the artificial anus; but fæces had passed by the urethra. This, however, was by no means inconsistent with the idea that the opening into the bowel was above the diseased part, since the lower part of the bowel was full of fæces at the time of the operation, and these must necessarily pass downwards. The unnatural position and great depth of the bowel we referred, at the time, to adhesions which had connected some lower portion of the gut to the bladder, and thus displaced its upper part.

He complained of a good deal of pain with dragging in the wound during the night; but it was moderated towards morning, and he obtained some snatches of sleep. Throughout the next day he was easier, and had little tenderness or distension of the abdomen; and though feeling nausea, did not vomit. Fæcal matter escaped from the artificial anus.

From this time nothing occurred to call for daily notes, the symptoms connected directly with the operation being remarkably slight.

On July 7th, it is noted that he was well enough to come down stairs, and that the motions had passed entirely by the artificial anus since the day of the operation, except on two occasions, when some fæcal matter had passed beyond the opening, and escaped both by the anus and urethra, causing him a good deal of distress. He expressed himself as greatly relieved by the operation.

16th.—I saw him again for the first time since the operation. He had certainly improved in health and in appearance; but some little trouble had occurred in the management of the artificial anus. In order to avoid the escape of fæces into the lower portion of the intestine, and to provide a free passage for them outwards from the upper portion, a gutta-percha tube had been inserted into the upper end of the gut, *i. e.* into the transverse colon, for the opening was situated directly below the splenic flexure. But this tube, though at first it fulfilled its purpose, could not be kept in position, but slipped round the angle formed by the two portions of the gut; and at the time of my visit

I found it lying in the lower or descending portion of the colon. Thus it served as a guide for the fæces into the lower bowel, and aggravated the mischief it was intended to remedy. A good deal of fæcal matter had passed into the lower bowel and bladder since the last note, causing him much distress. It was agreed to renounce the use of the tube, and to wash out the upper part of the bowel daily with an injection of warm water passed into the transverse colon, by which it was hoped that the upper part of the bowel would be daily unloaded, and that little or no fæces would pass at other times. This, however, did not prove to be the case. The fæces still passed at irregular intervals, but no longer into the lower part of the bowel. The artificial anus being left to itself, merely covered with a pad to keep the man's clothes clean, the upper portion of the gut began to protrude; and thus a projection of mucous membrane (the '*éperon*' of Dupuytren) was formed, which covered the mouth of the lower part of the bowel, and guided the fæces out at the opening. After the last note, no motion passed into the rectum or urethra, though some of the urine still passed from the anus.

The man gained much in strength, colour, and flesh, and had no complaint except of occasional pains in the lower part of the belly, from which he obtained relief by small doses of laudanum.

He was admitted into St. George's Hospital on September 15th, in order to be fitted with an apparatus to catch the fæces, and remained there for about six weeks. His general health was perfect, but he still complained occasionally of pain referred to the pelvis. His urine was perfectly natural. No fæces passed either by the urethra or anus.

After having been fitted with an apparatus, he was sent back into the country, but returned in January, 1866, in order to have the instrument altered, as it did not fit perfectly. His general health was still very good; he still complained occasionally of flying pains about the pelvis. Some water still passed, though only occasionally and in small quantities, from the rectum; but he was not sensible

of any air passing from the urethra, nor of any fæces in the urine; and the latter, being repeatedly examined, showed no trace of fæces. An opportunity was taken of examining the rectum by means of the endoscope. The surface was smeared with slimy and offensive mucus, but no disease could be detected; though the patient was brought under the action of chloroform (in consequence of his extreme sensitiveness), and the instrument passed as far as it would reach. There was no difficulty in doing this.

When discharged (February 21) he reported that no urine had passed per anum for a fortnight. The bowels acted at very irregular intervals, so that he was obliged to wear the apparatus night and day; with this his clothes were kept quite clean, and the only unpleasantness to those around him was a certain fæcal odour which hung about him.

In considering the general question of the propriety of performing Amussat's operation, it is of importance to bear in mind the fact that it may be performed in two very different classes of cases, and for objects which are also essentially different. Thus it usually is performed in cases of malignant disease, at the period of impending death, with a view of prolonging the patient's life and rendering it more tolerable; but with the certainty that the disease is in its nature both incurable and progressive, and will lead in a more or less short period to death inevitably. This is not the class of cases which I wish here to discuss, nor will I dwell upon the question whether the operation is justifiable in such cases. I will content myself on this head with remarking that the operation appears to be indicated on every ground, both of prudence and humanity, in the more slowly advancing forms of malignant disease; and that there are plenty of cases on record which show that in some instances the patient may pass a comfortable existence of several months—even in one case (recorded by Mr. Curling in the 'London Hospital Reports,' vol. ii, p. 11) as much as two years and a half.

My object in the present paper is not to deal with the operation as a palliative for the last stage of malignant disease, but to point out that there are states of the intestine, otherwise probably fatal, in which an opening made above the seat of the lesion may be curative, as far as the patient is concerned—that is, may enable him to live out the ordinary term of life, and die of some other disease. These are cases of obstruction depending on simple stricture, and cases of ulceration leading to vesico-intestinal fistula. I do not believe that the two pathological conditions are necessarily identical—that is to say, that the fistula is always the result of stricture—for reasons which I will presently state.

As to the treatment of simple stricture of the rectum by colotomy, I have no experience hitherto. I performed the operation a short time ago, in a case of stricture which appeared after death to be non-malignant; but the patient unfortunately died from the direct results of the operation. Mr. Curling informs me that he has recommended the operation in two cases, but it was declined.

The diagnosis between simple and malignant stricture, when the disease is seated at some distance from the anus, out of the reach of the ordinary means of examination, is always obscure; but the occasional occurrence of stricture unconnected with cancer is certainly an encouragement to recommend colotomy in obstruction situated near the sigmoid flexure, when the symptoms of cancer are not well marked.

The most ordinary cause of permanent communication between the intestines and the urinary passages is the breaking-down of cancer situated in or between the viscera; but numerous other cases of such communication are on record, and several of them will bear out the view which I have here advanced, viz., that such fistulæ occasionally form without any previous stricture. More or less of obstruction to the action of the gut may indeed have been noticed; but this is no more than occurs in ulceration of the œsophagus, where dysphagia frequently exists independent of any mechanical obstacle.

I will give a short summary of such of these instances of communication between the bladder and intestines as may be necessary to illustrate the above case.

1. In the 'Transactions' of this Society, there are two cases of intestino-vesical fistula which must be referred to. The first was under the care of Mr. Charles Hawkins (vols. xli, xlii). In this patient, the appearance of fæces in the urine was preceded by no symptom of obstruction of the intestines; and, after death, though much constriction of the gut around the abnormal opening was found, it appeared to depend upon the cicatrisation of the old ulceration (vol. xlii, p. 424). The communication was between the bladder and the sigmoid flexure of the colon, and the fæces passing into the bladder had given rise to the formation of calculus.

2. The second is the case related by Mr. J. Morgan in the last volume of the 'Transactions.' Here also the formation of the swelling in the iliac and lumbar regions which was caused by fæcal communication between the bladder and intestine, was preceded by no symptom of obstruction; nor after death was any tumour or stricture found. The bladder in this patient communicated with a coil of small intestine.

3. A third case is reported by Mr. Sydney Jones in the tenth volume of the 'Transactions' of the Pathological Society. This case was also examined after death, and here also the gut was equally free from all appearance of tumour. The communication was between the bladder and sigmoid flexure of the colon. Death in this case was caused by the irritation of the fæcal matter in the bladder, giving rise to vesical calculus and extravasation of urine.

4. Another case in which the communication is between the great intestine and the bladder is illustrated by a preparation in the Museum of St. Bartholomew's Hospital, ser. xvi, No. 72. The patient was a man eighty-five years of age, who died of asthma. No complaint had been made of any disease of the rectum or bladder till a week before his death, when air began to pass by the urethra, and

thenceforward both air and fæces passed with his urine, the latter chiefly in small masses about the size of peas. After death, a part of the rectum, eight inches from the anus, was found deeply ulcerated; and this portion of the gut was connected with the bladder by means of "thickened and indurated tissue," (the term appears to denote that it was not a new formation, and the whole description is evidently meant to imply the absence of cancer), and the ulceration had spread through this tissue, so as to form a wide communication between the bladder and rectum. The fact that the communication formed only during the last days of life precluded the possibility of calculus being formed.

In the 'Lancet,' 1864, vol. ii, p. 373, Mr. Moore has put on record a case in which the jejunum communicated with the bladder, and the patient laboured under vomiting and other symptoms of deranged digestion, attributed by Mr. Moore to the admixture of urine with the contents of so high a part of the intestine. This man suffered a good deal of pain in passing water, and so much straining that he was obliged always to pass fæces at the same time. The symptoms of inflammation of the bladder appear to have been considerable; so that the mixed urine and fæces became at length black and almost viscid. Death seems to have been caused partly by this inflammation, but mainly by the disturbance of the digestive functions already referred to, and by congestion of the brain.

It is sufficiently apparent from these cases, that simple ulceration may lead to perforation of the gut in various situations with or without previous stricture; and that, in some instances, this will cause the discharge of the contents of the bowel into the bladder, and in others the discharge also of urine from the anus. The cases also show us the three parts of the intestine which are most liable to be affected—viz., the rectum, the sigmoid flexure of the colon, and the small intestine. In those cases in which the communication is with the large intestine, the patient usually

experiences great distress, and more or less obstruction to the flow of urine, from the presence of lumps of fæces. Inflammation of the bladder follows, by which, very probably, the size of the communication is increased, and larger scybala are admitted into the bladder; thus increasing the patient's distress, and leading sooner or later to the formation of stone. When this event has taken place, though lithotrity (as in Mr. Charles Hawkins's patient) may afford relief, prolonged life can hardly be anticipated. No such consequence appears necessary from the passage of the more fluid contents of the small gut into the bladder. If, therefore, a certain diagnosis can be made of the formation of a permanent fistula between the bladder and the large intestine, I believe that the operation of colotomy is indicated, in order at any rate to preserve the patient from the sufferings and dangers of stone in the bladder; and after this operation, it appears highly probable that if the original disease be not cancerous, the fistula will close—at least this was the result in Mr. Pennell's case, as far as we can judge;[1] and it appears very probable that in my case the fistula will close, since the quantity of water which passes is only trifling, and appears to diminish. The closure of the communication would be a conclusive proof that the disease was not cancerous.[2]

The diagnosis of the precise seat of the lesion in the bowel must perhaps, in most cases, be only conjectural; I cannot say that in my own case I felt quite certain of it. If obstruction has preceded, possibly the quantity of fluid

[1] Pennell's patient came to London several years after the operation, and was seen by many of the leading surgeons of London. The patient's condition in respect of the passage of urine was not exactly noted; but, as the gentleman was in perfect comfort, and actively employed in business, it is unlikely that the urine should have passed into the rectum.

[2] I saw the patient again in September, 1866. He was in much the same condition, occasionally passing urine per anum, but not any fæces or air by the urethra. He still suffered from pains in the pelvis, and had a slimy discharge with the water and from the anus, as if some ulceration was still in progress.

which could be injected into the gut may have previously given the desired information.

In a doubtful case the diagnosis would rest chiefly on the appearance of the fæces which are mixed with the urine, and on the amount of obstruction to micturition which they produce. It was on this test that we relied chiefly in the case which I have related above, and it led us to a correct conclusion. If the fæces pass entirely by the bladder, there must be very formidable symptoms of dysuria when the communication is with the large intestine. If, however, any doubt exists, the operation may be regarded as exploratory; so that the gut would be left unopened and the wound re-closed, if the colon were found collapsed and containing no fæces.

The circumstance also of the passage of urine from the bowel is, I think, important in a diagnostic point of view. I have not been able to find, in the account of those cases where the communication has been with the small intestine, any notice of urinous discharge with the fæces; nor does it seem possible that urine admitted into the bowel at a great distance from the anus could be discharged in such a condition as to be recognised; so that the combination of the above symptoms will, I think, afford a sufficiently sure ground for diagnosis between fistula of the large and those of the small intestine.

Allowing this, can we feel sufficiently sure that the fistula of the large intestine is below the transverse colon? In answer to this question, I can only say that the probability seems to be very great, on anatomical grounds, that the sigmoid flexure or the upper part of the rectum is the part affected,[1] since those parts of the gut are either naturally in close proximity to the bladder, or may easily be brought into such proximity. It is hardly probable, I should suppose, that the ascending colon could form an adhesion to the healthy bladder. But in all cases of communication at a

[1] In a patient who was under Mr. M'Whinnie's care some time ago, and was also seen by Sir B. Brodie, the communication was thought by the latter to be with the transverse colon; but the case was not examined after death.

considerable distance from the anus, I should expect the discharge of urine to be unrecognisable; and in such cases great caution ought to be exercised in recommending any operative measure.

In conclusion, I must apologise for the necessarily imperfect nature of this paper. The cases are not sufficiently common to justify the hope that delay would enable me to accumulate experience which should form the foundation of solid and definite conclusions. Much, therefore, of what I have stated above with respect to the diagnostic signs of these rare lesions is conjectural, being founded on the observations of a single case. That case, however, was sufficiently striking to show me that the operation of colotomy may occasionally prove the means of rescue from a state of horrible and disgusting suffering, and, as I believe, of restoration to a state of general health and tolerable comfort.

ON A CASE

OF

HYDATID DISEASE OF THE LIVER,

AND

REMARKS ON THE TREATMENT OF SIMILAR TUMOURS.

BY

JOHN HARLEY, M.D. Lond., F.L.S.,

ASSISTANT-PHYSICIAN TO KING'S COLLEGE HOSPITAL, ETC.

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The following case of hydatid disease of the liver, in which cure has been effected, presents, from the enormous size of the tumour, its communication with the gall-bladder, and the occurrence of hæmorrhage from the liver, so many points of interest that I have thought it worthy of bringing before the notice of the Society.

In June, 1863, Mr. B. G—, æt. 29, a gentleman of good development and vigorous constitution, applied for my advice on account of a large tumour which had arisen in the epigastric region about four years previously, and slowly increased to such an extent as to cause, when dressed, very conspicuous deformity of the chest and abdomen.

At this time the patient was moderately muscular, defi-

cient of fat, pale and sallowish, with dark areolæ around the eyes. All the functions were naturally performed. He had been, and continued to be, constantly engaged in an office in the City. Long standing induced a feeling of faintness; but he was able to go about as usual, and not unfrequently walked four miles without inconvenience. The lower half of the chest and the whole of the abdomen were enormously but uniformly distended by a dull, tense, fluctuating tumour. The lower ribs, as well as those bounding the lower part of the chest-wall, were pushed widely outwards. The distance between the point of the ensiform cartilage and the umbilicus was much increased, and the most prominent part of the tumour corresponded to the centre of this elongated space. As the tumour ascended beyond the margin of the chest-wall in front, and at the sides where the parts were very much stretched, no limit could be felt in the upward direction. Below, the tumour gradually subsided towards the pubic region, and its lower rounded border could be distinctly felt two fingers' breadth above the pubis and the inner ends of Poupart's ligaments. From this lower boundary, and excepting a narrow space on either side of the abdomen, uninterrupted dulness extended upwards to all parts of a horizontal line surrounding the chest on a level with the nipples. Percussion upon either of the distended regions produced distinct fluctuation throughout the whole of the tumour. Neither the liver, the spleen, nor any other solid body could be felt. Two little veins emerged at the right edge of the ensiform cartilage, and formed swollen ramifications as they passed upwards and disappeared.

Over the most prominent part of the tumour—a point midway between the ensiform cartilage and the umbilicus—the body was 40½ inches in circumference.

Above the line of dulness, the lung-sounds were natural; but there was an absence of vesicular murmur, and distinct bronchophony was heard at the bases of both lungs behind. On taking a deep inspiration, a rubbing sound, like that caused by the motion of two pieces of wet leather the one

upon the other, was heard in the left scapular region. The heart was displaced upwards, and the cardiac dulness corresponded to a space of about two inches in diameter, the centre of which was half an inch above and to the sternal side of the left nipple. The heart-sounds were distinctly heard everywhere over the front of the chest on the left; they were most distinct a little above and to the left of the nipple, and thence towards the axilla. Over the natural position of the heart, and thence to the margin of the left ribs, the sounds were peculiarly naked and tense, as if transmitted from a distance by a good conducting medium. A moderately loud systolic bruit was heard at the base near the left edge of the sternum, on a level with the nipple; and, a little to the left of this, a fainter diastolic bruit. The pulse was natural, and the volume moderate.

Previous history.—The patient has lived temperately, is free from constitutional disease, and has always enjoyed good health; is liable to boils, but was never laid up with any illness except in connection with the disease under consideration; has never had rheumatism, nor any cardiac or pulmonary affection; never had jaundice or tapeworm; has lived seven years in Australia, and been exposed to the hardships incidental to a country life there; was often obliged to drink stagnant, and sometimes muddy water, and always preferred imperfectly cooked meat. He returned from Australia in the year 1859. In March of this year, and while still in Australia, he was attacked with severe stabbing pains in the left side of the abdomen, a little towards the front. For twenty-four hours the pain was continuous and agonising, and he could neither lie down nor suffer himself to be touched. The pain did not produce vomiting, but it was accompanied by a dry cough and sharp pain on inspiration. The pain recurred at intervals for a fortnight, and then gradually decreased. Since this time he has occasionally had a slight return of pain in this situation; and as pressure upon the left induces it, he constantly lies down upon the right side. About this time an abundant herpetic (?) eruption appeared upon the trunk and

limbs, and continued for some months. Some finely pitted scars, attesting its pustular nature, still remain upon the legs.

Three or four months after this severe attack of pain, in July 1859, while on his passage home, he discovered a little fulness of the epigastrium below the margin of the ribs; and since this time he has lost a little flesh, and his strength has gradually diminished.

In 1860 he had another attack of severe pain in the same part. He was laid up for a fortnight, and in the second week there was constipation for five days. Since this time the tumour has gradually increased to its present size. His health has continued fair, and his occupations have only been interrupted twice or thrice, and for only a day or two at a time, by the recurrence of the old pain and a feeling of weakness.

From the history of the case, and the nature and situation of the tumour, I concluded that the patient was the subject of hydatid tumour of the liver. As he enjoyed good health and his occupation required no great physical exertion, and as the tumour had already attained so great a size, I thought it better to recommend no present interference. I explained the nature of the disease to the patient, and directed him to avoid straining, jolting, and all violent motion, and to be slow and careful in all his movements. As his condition was somewhat anæmic I prescribed chalybeate medicine, and requested him to carefully notice if there should be any increase in the size of the tumour, and to see me from time to time.

October 8th, 1863.—Has enjoyed fair health and pursued his usual occupations continuously since June, and he is now in the same condition as at that date. Complains that he occasionally has deep-seated pain about the upper angle of the left scapula. It is sometimes very troublesome in bed. At times he experiences a deeply-seated pain in a single spot behind the left edge of the sternum, in the situation of the heart. Measurement around the body, at the same level as before (midway between ensiform cartilage and umbilicus),

shows an increase of half an inch, viz., 41 inches. The lower border of the tumour is rounded and distinct in the right iliac region; towards the left iliac region, a harder and more solid, thick, and slightly uneven boundary is felt. I take it to be the anterior margin of the left lobe of the liver.

July 7th, 1864.—Measurement over the same part 41¼ inches. No increased dulness of the chest, and the heart- and lung-sounds have not undergone any alteration. The patient complains of pain transmitted from below to a very tender little swelling over the junction of the manubrium and second piece of the sternum, whence it extends to the left shoulder and down the inside of the left arm.

In all other respects he has continued well, and there has been an increase in girth of only three fourths of an inch during the last year.

June 15th, 1865.—Measures around the same part 42⅝ inches. The tumour has descended a little, so as to leave another inch of horizontal resonance of the chest. The abdomen is fuller and the tumour more tense; otherwise the condition of the patient is the same as it has been during the last two or three years.

The tumour was at this time so tense, and the cyst-wall appeared so thin, that I now began to feel great anxiety lest it should be ruptured by some accidental strain. I cautioned the patient to avoid everything that might lead to such an issue, and determined to adopt at an early period some operative means for his relief.

July 17th, 1865.—On getting out of bed this morning, the patient was seized with a severe darting pain in the right iliac region; the pain increased at intervals to paroxysms of intense agony. The paroxysms were announced by a severe stabbing pain, which soon assumed an excruciating twisting and bursting character. While the pain continued the part was very tender to the touch; but in the intervals there was no particular tenderness, but only a fear lest palpation should excite the pain afresh.

I was summoned to him on the 21st of July, and saw him

in consultation with Dr. John Meaburn Bright, of Forest Hill, who was in attendance upon him. I found that the tumour had increased considerably in size in the right iliac region; but as yet there was no indication of the rupture of the sac, and the peritoneal inflammation was of very limited extent. Believing that a slight increase of fluid within the sac would determine its rupture and cause the death of the patient, I resolved to puncture the tumour. Dr. Bright concurred with me as to the necessity of this step, but we deferred the operation, hoping that the inflammatory action would result in adhesion of a portion of the sac to the abdominal wall, on account of which we might puncture the tumour with greater safety. For the present, therefore, we watched carefully and employed only palliative treatment.

July 26th.—The intervals of freedom from pain have been longer, and yesterday he was altogether free from pain for six hours. Since the 17th inst. the abdominal portion of the tumour has considerably increased in size. It is everywhere rounded; smooth, very tense, and everywhere fluctuant, and the fluid is evidently included within a single cyst. The pulse has lately risen to 120 during the paroxysm; and today there is superficial tenderness over the right hypochondriac and iliac regions, where the distension has lately increased very much. The patient is free from feverishness; the bowels have been well relieved by castor oil and enemata; opiates have given relief, but the patient has little or no continuous sleep.

The following are the measurements taken this day:—Round the body on a level with the tip of the ensiform cartilage, $40\frac{3}{8}$ inches; midway between the tip of the ensiform cartilage and the umbilicus, where the former measurements were made, $44\frac{1}{2}$ inches, which is nearly 2 inches more than the measurement taken only a month previously. Over the umbilicus, 40 inches; midway between the umbilicus and the pubes, $37\frac{3}{4}$ inches; from the tip of the ensiform cartilage to the pubes, $13\frac{1}{2}$ inches. As the tumour was undergoing such rapid enlargement, I resolved to delay no longer in evacuating the fluid. The patient willingly acceded. On further

consideration, I concluded that it would not be safe to tap in the right hypochondriac region, for I did not feel sure of the adhesion of the sac in this situation; I therefore selected a point in the median line midway between the ensiform cartilage and the umbilicus, where the tumour was most prominent. The patient kept the recumbent posture, and bandages having been previously applied around the margin of the ribs and the abdomen, Dr. Bright introduced a No. 11 canula, which on withdrawal of the trocar readily slipped backwards to its shoulder; the trocar having been introduced, with the point directed very slightly upwards, for the distance of only an inch.

Dr. Ray, of Dulwich, and Mr. Hill, of Sydenham, were present at the operation, and kindly gave us their assistance.

Immediately that the trocar was removed, fluid as limpid, clear, and colourless as water, was ejected with great force. The complete evacuation of the fluid occupied two hours. I occasionally interrupted the flow for a minute or two at a time, in order to secure the more effectual contraction of the cyst. The last two or three pints oozed slowly away, and the discharge was facilitated by pressure on the abdomen and sides of the chest, and ultimately by causing the patient to take deep inspirations. Nineteen pints and a half (390 ounces) were ultimately withdrawn. The greater portion of the fluid was colourless; but towards the end of the operation it gradually assumed a light yellowish colour, which increased in intensity. The last pint was grumous and of a bright yellow colour from admixture with bile. Not a trace of blood appeared throughout. Some ruptured hydatid cysts of gelatinous appearance, about the size of walnuts, and a number of minute unruptured ones, the size of peas, came away with the fluid. The evacuation of the fluid was unattended by pain, and gave the patient immediate relief. There was no tendency to syncope; the abdomen became quite flaccid and free from pain on pressure, and the rounded outline of the shrunken cyst could be felt distinctly just below the umbilicus, and thence extending upwards on the sides

towards either hypochondrium, where the outlines were indistinct. At the end of the operation, a little fluid continued to run from the canula on taking a deep inspiration; and as I had determined not to remove the canula so long as there should be any oozing of fluid, a pad of lint and a folded towel were placed over the orifice, and the whole retained by moderate pressure with the abdominal bandage.

Flannel rollers were tightly applied around the lower margin of the chest. The pulse after the operation was 95, soft and compressible. To take 10 grains of compound soap-pill to-night.

The morning after the operation, the patient was in a very comfortable condition. He had passed a good night, and was now free from pain. The abdomen soft, flaccid, and free from tenderness. Pulse 124; respirations 30. A severe eruption of urticaria covers the neck and arms. The bandages and compresses are saturated with discharge, and stained bright yellow. The canula was worn without inconvenience, and a yellow bilious fluid containing a little mucus constantly oozed from its orifice.

Three days after the operation, a large rounded tumour about the size of a child's head could be felt in the right hypochondriac and epigastric regions. In common with the rest of the abdomen, these parts were free from tenderness.

The patient continued free from febrile disturbance and pain, and progressed most favorably, living upon a liberal allowance of mixed animal and vegetable diet and stimulants, until the *eighth* day, when, the canula having partially slipped out of the wound, there was complete retention of the discharge for about twelve hours. The distended sac was tender, and formed a rounded prominence in either hypochondrium; there was pain along the margin of the left ribs; the skin was hot; the countenance very sallow. Pulse 120; respirations 17. On replacing the canula, eight ounces of deep yellow turbid fluid of offensive odour were immediately evacuated, and free discharge of the contents of the sac was re-established. The febrile symptoms disappeared, and all went on well until the membranous walls

of disintegrated hydatid cysts began to obstruct the discharge. Fragments of laminated membranes first appeared on the *tenth* day; but they did not cause any obstruction until the *fifteenth* day, when there was complete arrest of the discharge. The sac was distended, and the pain along the margin of the left ribs and febrile action were renewed. An elastic catheter was introduced through the canula to a distance of nine inches within the sac, and with some difficulty twenty ounces of light ochre-coloured, slightly viscid fluid, and much broken-down cyst-wall, were evacuated. This was followed by immediate relief.

For the first fifteen days, about twenty ounces of fluid were discharged every twenty-four hours, but on several occasions it was much more abundant; and this temporary increase was apparently due to rupture of the larger secondary cysts.

From the *fifteenth* to the *seventy-eighth* day, disintegrated cyst-wall was constantly discharged, causing impediment, and occasionally, for a few hours at a time, complete obstruction to the discharge of the fluid contents of the sac. During the whole of this period great difficulty was experienced in emptying the sac.

On the *forty-third* day, the canula was removed, and a No. 9 elastic catheter inserted and retained in place of it. From this date to the *fiftieth* day the discharge diminished to four or six ounces daily, and the sac meanwhile became distended. On the last-mentioned day, twenty ounces of fœtid fluid were withdrawn, and the discomfort and feverishness attendant upon the distension of the sac abated.

The day after, a new and dangerous symptom appeared. Hæmorrhage to a considerable extent took place within the sac. The pulse went up from 96 to 140, and in the evening to 160. Vomiting had occurred several times; the skin was hot, dry, and jaundiced; the epigastric and hypochondriac regions were occupied by the hard and distended sac, but the rest of the abdomen was soft and natural. A pint of thick, fœtid, bloody fluid, of the same rich chocolate-red colour as the blood which exudes from the cut surface of

fresh liver, was removed from the sac. Fragments of cyst-wall continually obstructed the eye of the catheter, so that very little discharge now oozed from its outer extremity. By patiently withdrawing and introducing the catheter time after time, and injecting creasote water through it to wash away the débris of the cysts, half a pint more of the bloody fluid was removed.

For many days the fæces had been completely destitute of bile, and were of a glistening aspect and putty colour. This evening the patient passed a very copious pultaceous shiny stool, having the same rich reddish-brown colour as the discharge from the sac. It was clear that the distended sac had relieved itself by the passage of a portion of its contents into the intestinal canal.

During the next week, much disintegrated blood-clot came away, and oozing of blood within the sac continued. The patient meanwhile was much weakened and depressed. The jaundice disappeared, and the appetite had returned on the *fifty-third* day. The alvine secretions, however, continued to be entirely destitute of bile, and they were very offensive. The discharge from the sac had contained a large quantity of bile from the first, and the proportion of this secretion appeared now to be on the increase. After the sac had been washed out, a stream of pure, unmixed ropy bile flowed from the orifice of the catheter as it lay inserted eight or nine inches within the sac. I collected half an ounce of this pure bile in the course of a few minutes, on several occasions. It was evident that we were in direct communication with the gall-bladder, and that the discharge from the sac, which some days previously had found its way into the intestine, must have been conveyed by the bile-duct. The discharge of pure bile at the end of dressing continued from the *fifty-seventh* to the *sixty-fifth* day. The discharge from the sac then resumed its usual bilious character, and decreased in quantity The fragments of the cysts continued to offer a great obstruction to the flow of the discharge, although the passage leading to the sac was now sufficiently dilated to admit three large elastic

catheters. But on the *seventy-fifth* day we succeeded in evacuating a teaspoonful of thick laminated membranes, some of which were six inches square. This was effected by moderately distending the sac with creasote water, and suddenly withdrawing the three catheters, the patient giving at the same time a series of little coughs. Excepting a stray fragment or two, the whole of the laminated membranes that had been retained in the sac were removed on this occasion, and henceforward there was no impediment to the flow of the discharge, nor difficulty in washing out the sac. On two occasions, the sixty-second and the seventy-fifth days, large thick fragments of dense blood-stained fibrous tissue came away. These were, no doubt, portions of the original cyst which had become detached from the liver. The hæmorrhage was clearly due to the separation of these fragments, and the exposure of the parenchymatous substance of a portion of the liver.

On the *eightieth* day, the patient had recovered his lost ground, and the fæces had returned to a natural condition.

On the *eighty-first*, a severe attack of dyspepsia, accompanied by great flatulent distension of the abdomen, and violent eructations and vomitings, occurred. The attack lasted with decreasing severity for a week; meanwhile the discharge from the sac increased. Of late the average had been eight ounces in the twenty-four hours, and it was a dirty yellowish-white muco-purulent fluid; but at this day, and for the following week, from sixteen to twenty ounces of a grass-green mucous fluid—diluted bile—were daily discharged; and this was associated with absence of bile from the alimentary canal. The sac, however, was daily contracting, and I began to fear that the common bile-duct would be so implicated in the contraction as to become obliterated. It was with extreme satisfaction that Dr. Bright and myself witnessed the reappearance of bile in the stools on the *one hundred and second* day.

During the next month, the bilious discharge gradually decreased.

On the *one hundred and twenty-third* day, the discharge was totally free from bile, and consisted of dirty-white inodorous pus, amounting to three ounces only in the twenty-four hours. The sac meanwhile contracted, and the catheter, which formerly passed nine or ten inches into its interior, would now pass only four inches.

On the *one hundred and thirty-eighth* day, a tinge of bile appeared for the last time. The sac had almost entirely contracted. The discharge consisted of a dirty-white inodorous pus, and did not exceed a table-spoonful in the twenty-four hours: the catheter merely occupied the retracting passage, and not more than two drachms of fluid could be injected.

On the *one hundred and forty-eighth* day, the discharge had ceased, and the catheter was finally removed. During the last month the patient had rapidly regained flesh and strength, and he was able to leave his room and walk out.

On the *one hundred and fifty-eighth* day (January 1st, 1866), the patient resumed his ordinary occupations in the City, and has continued them without interruption up to the present time, with the enjoyment of increasing health and strength.

The following was his condition on the 1st of January, 1866, rather more than five months after the puncture of the tumour:—A little stouter than he was before the operation, but pale and anæmic. Measurement around the body at the level above indicated—viz., midway between the ensiform cartilage and the umbilicus—$31\frac{1}{2}$ inches, being 13 inches less than the measurement on the day when the tumour was punctured, and 9 inches less than when the patient first came under my notice, in June, 1863. The cicatrix retracted upwards, and the parts around dull and hard. No trace of the tumour remains. The hepatic dulness normal. The spleen feels hard, and it is enlarged, projecting below the margin of the left ribs. The appetite is good; the bowels act regularly, and the fæces are quite healthy. The compressed lungs have expanded, and

the extent of resonance and vesicular breathing is normal. The heart has returned to its proper position; the first sound is now healthy, and the second is accompanied by only a faint diastolic bruit.

I made my last examination of my former patient on the 7th September, 1866, when these sheets were in the printer's hands. The following are the particulars:—Body fat and muscular, and complexion healthy; weighed before the operation from eleven stone to eleven stone three pounds; weighs now eleven stone, showing an increase, *minus* the tumour, of about two stone; figure perfectly natural. The cicatrix looks exactly like a second navel, situated midway between the tip of the ensiform cartilage and the umbilicus. The hypochondriac regions and the epigastrium, including the parts immediately around the cicatrix, are perfectly soft, and the fingers deeply pressed into these regions fail to detect any tumour or thickening whatever, or to excite pain or uneasiness. The epigastric and left hypochondriac regions are resonant. The liver dulness is of normal extent, commencing four fingers' breadth below the right nipple and terminating at the margin of the ribs. The abdomen is flat and natural, and the spleen has returned to its normal size and position—indeed it can no longer be distinguished. Measurements:—From the tip of ensiform cartilage to the umbilicus, $5\frac{1}{4}$ inches (the cicatrix is equidistant from these parts, inclining a little to the left of the median line, and is slightly retracted upwards); around the body, on a level with the cicatrix, $33\frac{1}{2}$ inches; and on a level with the ensiform cartilage, 34 inches. Resonance of the chest of normal extent; lung-sounds healthy. Cardiac dulness normal in extent and situation, apex-beat an inch below, and internal to the left nipple. The systolic bruit is no longer heard, the first sound being strong and healthy; a distinct sawing sound accompanies the diastole. Its seat is immediately beneath the junction of the first and second bones of the sternum. The pulse is natural; all the functions are healthily performed. Although his work has been unusually heavy since he resumed it

in January, he has progressively improved in health and strength.

Treatment.—As there was no evidence of the adhesion of the walls of the cyst to the abdominal parietes, I feared to do less than withdraw at once the chief bulk of the fluid; and when I found that the elasticity of the sac was such as to expel the fluid with extreme force, I had reason to be satisfied that I had not adopted partial measures, such as capillary tapping or the removal of only a portion of the fluid. In this case either of these modes of treatment would most probably have been followed by the escape of hydatid fluid into the peritoneal cavity. Anticipating that the sac would rapidly refill—in which case the introduction of the trocar and withdrawal of the canula would have been almost equivalent to rupturing the sac and allowing its contents to escape into the abdomen—I resolved to retain the canula within the wound as long as there should be any discharge.

Dr. Bright used a medium-sized instrument, and the treatment consisted in placing a flannel bandage around the abdomen, below the canula, with a compress upon the right hypochondrium, and another bandage around the lower part of the chest above the canula, which latter was retained in its position by placing folded diapers over its orifice and retaining them by another light bandage. The canula was retained within the wound until the 7th September, when having become loose and inclined to slip out of the wound, it was removed, and an elastic catheter (No. 9) introduced into the sac in its stead. Prior to this, the discharge of the cyst-wall of the disintegrated hydatids began to obstruct the discharge of the fluid which constantly accumulated within the sac. Fearing that an elastic catheter would not be effectual in maintaining a direct passage into the sac, and that there might be some difficulty in reintroducing it, I wished to preserve the communication with the sac by means of a curved silver tube. A No. 12 double-canuled silver catheter was readily introduced nine inches within the sac, but it proved useless. I therefore procured a

silver tube, curved like an ordinary catheter, of No. 16 gauge, a little contracted at the point to facilitate its introduction, and terminating in a round orifice of No. 11 gauge. This tube passed without much difficulty into the sac, and it was worn with comfort for three days but not an ounce of discharge flowed away through it during the whole of this time, and the accumulated discharge was evacuated by other means at the times of dressing. On visiting the patient on the evening of September 22nd, we found that no fluid had been discharged through the silver tube, although the sac was distended, and the wide tube moved freely in every direction in the accumulated fluid. It was removed; the discharge was evacuated with difficulty by means of an elastic catheter. The silver tube was again introduced, and about a pint of creasote water injected; none returned until the sac was painfully distended, when about half a pint was rejected with a sudden gush; more could not be obtained,' although the tube was moved to every part of the sac, and inserted now a short way, and now seven or eight inches within it. It was evident that the orifice of the tube was entangled amongst the detached laminæ of the hydatid cysts, which being forced towards it in every direction by the distension of the sac, occluded it like so many valves. The same thing occurred when a single catheter was introduced, and we now began to experience the greatest difficulty in evacuating the contents of the sac. The mode in which it was effected for two or three weeks about this time was as follows:—A No. 9 elastic catheter was inserted into the sac; a little discharge would then flow for a second or two, and then an arrest occurred; a fragment of cyst-wall was removed from the orifice of the catheter, or a little creasote water injected to wash it out of the internal orifice, and the discharge would perhaps again flow. By this means, and by frequently removing the catheter and washing cyst-wall out of its eye, and by teasing away fragments which had followed it to the orifice of the wound, the sac was emptied and washed out with cold creasote water (℞ Kreasoti ℥xl, Aquæ ℨxxxvj) every night

and morning. Dr. Bright attended the patient night and morning throughout the progress of the case, and to his assiduous and patient attentions the safety of the patient was due. The time required to evacuate the contents of the sac and the difficulty in effecting it, now required the adoption of some means to effect the dilatation of the passage for the discharge of the larger coriaceous fragments of cyst-wall. For this purpose I employed elastic catheters: we left three small ones (Nos. 9, 7, and 4) in the sac, and by daily increasing their size to No. 12 our end was attained. When the catheters were introduced within the sac so that their extremities reached to slightly unequal distances, the cyst-wall was generally kept away from the orifice of one at least, and while creasote water was being injected along one catheter, discharge accompanied by cyst-wall was ejected from the others. By this means thickish laminated fragments six square inches in extent were discharged. On October 11th, the passage was sufficiently dilated to allow of the discharge of a teacupful of large leathery fragments of cyst-wall—all, in fact, that now remained within the sac. The ejection of these was secured by injecting the sac with creasote water and preventing its escape, and then suddenly withdrawing the catheters while the patient gave a succession of coughs.

While we were endeavouring to secure free discharge of the fluid formed within the sac, I had two other objects in view: viz., 1st, to prevent decomposition of the contents of the sac; and, 2nd, to excite inflammatory action within its interior. These were attained by the injection of iodine and creasote water: ʒj of the compound tincture of iodine of the London Pharmacopœia was injected into the cyst three days after it was tapped (July 28th); and this was repeated morning and evening for about a week, when the quantity was increased to ʒij twice a day. From the 14th to the 23rd of August, ʒj of the tincture was injected through the canula daily. The evening injection was now discontinued on account of the profuse night-sweats which it appeared to produce, and ʒvj were injected every morning only, until the

17th of September, when the injection of iodine was left off altogether. During these seven weeks, upwards of ℥xxx of the tincture of iodine, diluted with an equal quantity of creasote water, were thrown into the sac. No pain was ever produced; but when the sac became a little tender, a feeling of warmth in the epigastrium followed the injection.

The iodine injection was continued until hæmorrhage occurred within the sac, when gr. v—gr. x of nitrate of silver, dissolved in a few ounces of water, was substituted, the sac being previously washed out as before with creasote water. At the end of a week I discontinued the nitrate of silver, and directed the sac to be first washed out with plain creasote water, and, subsequently, with ʒj of sulphate of zinc dissolved in ℥x of creasote water, every morning and evening.

Throughout the whole treatment I found it of the utmost importance to give support to the lower part of the chest, and had laced bandages made for this purpose. The ribs had been so widely distended, that if left to themselves they were laxly divergent. It was equally necessary to keep the abdomen tightly bandaged, with a compress upon the right side so as to press the contracting sac towards the right hypochondrium. As often as the compress was set aside, a slight distension took place in that most dependent part of the sac which lay in the right iliac region. Another difficulty that we had to contend with was the deficiency, and, for a very considerable portion of the time, a total absence of bile from the intestines. Fortunately, the patient's appetite did not suffer in consequence, and I attempted to supply the place of the absent secretion by the introduction of inspissated ox bile, in doses of 20 grains, every night, with occasional intervals. For the greater part of the time he took ♏xv—xx of perchloride or pernitrate of iron, alone or in combination with quinine.

At one period (Oct. 16—20) the patient was greatly troubled with flatulent dyspepsia, and this was associated with fæcal accumulation in the ascending colon, and it was necessary to employ free purging. The accumulation was,

doubtless, to be attributed to adhesions, which, having formed between the sac and the right bend of the colon, impaired the contraction of this part of the alimentary canal. Pressure upon the right hypochondrium at these times readily induced eructations.

General observations and rules for treatment.—It is remarkable how little disturbance of the sympathetic system occurred throughout the treatment of the case, and how readily the displaced and compressed viscera resumed their position and recovered from the effects of pressure so prolonged. The tumour was seated in the midst of the sympathetic plexuses, and caused distension of all parts about the solar plexus. The sac evidently lay upon the aorta, for whenever a catheter was passed backwards until its point touched the posterior wall of the sac, strong pulsations were felt; at one time it was easy to feel that the sac had contracted extensive adhesions with the diaphragm along the margin of the ribs upon the left side, and whenever it became distended pain was felt in this region. The absence of bile from the intestinal canal was always associated with a disgust for fat of all kinds; and the putty-coloured fæces contained undigested, unemulsified oil, which gave to them a soft glistening appearance, like that of frosted silver.

It would appear that the cyst was in an actively growing state; no cretaceous matter was ever observed in the discharges. The first ten or twelve pints of fluid withdrawn were of the usual character—a clear limpid, slightly salty fluid, destitute of albumen, and of specific gravity 1007. The last portions were turbid, from the presence of yellow grumous matter, altered and inspissated bile. Each drop of the turbid deposit contained multitudes of hooklets, free scolices, and minute cysts, the $\frac{1}{20}$th of an inch in diameter, containing numbers of attached scolices in all stages of development. The parasite was evidently derived from Australia, but the scolex is identical in appearance with that found in hydatid cysts of European origin.

The pure bile which was occasionally discharged un-

doubtedly came from the gall-bladder, for it contained so much mucus and was so viscid that it could be drawn out into strings more than a foot long. It was equally clear that the great cyst did not directly communicate with the gall-bladder, else the whole of the fluid would have been tinged with bile. I can only explain the fact by supposing that a small and probably collapsed hydatid cyst existed beside the large one, and communicated, on the one hand, with the gall-bladder, and, on the other, with the larger cyst, and that during the growth of the tumour the aperture of communication was closed either by the secondary cysts or by the compressed fluid in some such way as the orifices of the ureters are closed by a distended bladder.

Having observed this complicated case with much interest, and given it close attention, and subsequently studied the histories of those cases in which cure by operative measures has been attempted, I am convinced of the necessity of observing the following rules in the treatment of hydatid tumours of the liver:

1. They should be punctured *above* the umbilicus, because the sac, however large, possesses great elasticity, and ultimately contracts into the epigastric or hypochondriac regions.

2. As soon as operative measures are determined upon, the sac should at once be punctured with a large trocar, and the canula retained so as to keep up free communication with the interior of the sac. No care need be taken to prevent the admission of air; there is much less danger in exposing the interior of a large cyst to the air for months than in closing up the external orifice for a few days. Nor ought we to be content with merely keeping a canula inserted; but by passing a small catheter from time to time within it, should anticipate obstruction of the discharge and distension of the sac by pushing away, breaking down, or teazing-out the secondary cysts or their fragments, which, so long as they remain within the sac, will continue to impede or prevent the flow of fluid, however large the orifice of the canula may be.

3. The canula may be retained until it is loosened by suppuration and tends to slip out. Its place should then be supplied by two or three elastic catheters, and their size gradually increased until three or more of No. 12 size can be readily introduced. By advancing the ends of two beyond the others, and causing the eyes to look inwards towards each other, we have an effectual contrivance for preventing the closure of some, at least, of the eyes by the pliable fragments of cyst-wall. A single catheter, or a single wide tube, is ineffectual in emptying the sac.

4. In order to facilitate the disintegration of the cyst-wall, and to excite inflammation and adhesion of the sac, iodine should be freely injected. As soon as a glow of heat is felt on injecting it within the sac, or this becomes tender under pressure, the iodine injection should be discontinued.

5. To prevent decomposition of the fluid within the sac, it should be washed out morning and evening with creasote water (creasote 40 drops, water 36 ounces). I found this most effectual in preserving a healthy condition of the sac. On one occasion more than a gallon of cold creasote water was passed through the sac. The injection should be passed down one catheter, and allowed to flow out with equal rapidity through one or two others. Distension of the sac should be most carefully avoided, especially when it is healing. Pain, and, on more than one occasion, bleeding, was produced in the case above related by injecting the fluid faster than it flowed away.

6. After the separation and discharge of the cyst-wall, the sac may be washed out with a solution of sulphate of zinc in creasote water. I employed it in this case chiefly with the view of arresting and preventing hæmorrhage, but there can be no doubt that it facilitated the contraction of the sac, and I should be inclined to recommend its use in all cases during the healing of the sac.

7. For treating tumours of great size, the strictest attention must be given to bandaging, in order to preserve the contraction of the sac. In the case above recorded the

sac had evidently contracted such firm adhesions to the diaphragm and inferior margin of the chest-wall that, being firmly retained in the epigastric and hypochondriac regions, it extended itself chiefly in the lateral directions, pushing the inferior parts of the chest and lower ribs much outwards. Long after the softer parts had regained their resiliency I found that the bony chest-wall remained flaccid and spread outwards, and that by compressing the hepatic and splenic regions together the capacity of the sac was diminished, as evidenced by the escape of air or fluid. A laced bandage should be placed around the lower part of the chest, embracing the hepatic, splenic, and epigastric regions, before the sac is punctured, and it should be constantly worn and tightened during the contraction of the sac, and for some months after the patient has recovered. Support should equally be given to the abdomen, and compresses placed upon any depending portion of the sac. By these means the attenuated diaphragm is restrained in its movements until it has recovered.

8. Bleeding and the discharge of bile into the sac can only be effectually prevented by promoting its contraction. The external bandages should be tightened, and injections of nitrate of silver and sulphate of zinc freely used. If there be no impediment to the discharge from the sac, it may be frequently washed out with cold water.

As far as my search has extended I find that the tumour in the above case is the largest for which operative proceedings have been undertaken with success; and since the treatment here advocated has been successful in the case of so large a tumour, it may, *à fortiori*, be employed for the destruction of those of smaller size. The withdrawal of a pint or two of fluid from smaller tumours has not unseldom proved fatal, and we cannot be sure that such treatment will result in the radical cure of the disease (see Table I).

Appended are synoptical tables of all those cases of hydatid tumours of the liver in which operative measures have been adopted that I have been able to glean from

various sources. In my remarks I have endeavoured to point out the advantages of securing the free discharge of the contents of the sac, and the dangers which follow its suppression. In the compilation of these tables I am chiefly indebted to four sources :

1. Mr. Cæsar Hawkins's papers "On Eycysted Tumours of the Liver" in the 18th vol. of the 'Medico-Chirurgical Transactions;'

2. M. Cruveilhier's Art. "Acéphalocystes," in vol. i, 'Dictionnaire de Médecine et de Chirurgie pratiques;'

3. M. C. Davaine's 'Traité des Entozoaires;'

4. Dr. Cobbold's 'Entozoa.'

From an analysis of these 100 cases it appears—1st, that of the 34 cases which were treated by a single puncture, evacuation of a portion or of the whole of the fluid, and immediate closure of the wound (see Table I), there were 11 *cures*, 13 *recoveries*—*i. e.* cases which were relieved by the operation, but which, since the tumour was not wholly removed or the result sufficiently certified, cannot be regarded as radical cures—and 10 *deaths*. Irritating injections were employed in Cases 27, 31, 33, and 34. One death (Case 13) was probably due to premature labour two or three weeks after the operation, the cyst being found collapsed; another (Case 15) was caused by rupture of another cyst into the lungs.

In the great majority of cases a single puncture is wholly ineffectual (see Tables II, III, IV, and V), and those who most strongly advocate this mode of treatment admit that it is only effectual where the tumour is of small capacity. Unless decided inflammatory action ensue within the cyst, which in a closed sac must always be attended with great danger, destruction of the parasite and radical cure of the disease can hardly be expected. In Cases 96 and 99 the parasite continued to maintain its existence for many years, notwithstanding the spontaneous rupture of the cyst and (in one) the operation performed upon it three years afterwards. The immediate dangers of puncture and closure of the wound are due—1st, to re-accumulation of fluid and

distension of the sac, resulting, when there are no adhesions with the abdominal wall, in overflow into the peritoneal cavity or elsewhere (*e. g.* Cases 32, 35, &c.); and 2nd, to excessive inflammatory action and the formation of putrid fluid within the sac. In Cases 48, 51, 54, 63, &c., clear watery fluid followed the first puncture, and fœtid pus the second. This second danger might probably be avoided by the plan adopted by Dr. Budd (see Case 1). In five, at least, of the fatal cases (Table I) death is attributable to re-accumulation of the fluid and its alteration and retention within the sac. In several cases of recovery re-accumulation of fluid took place, and in some this was accompanied by considerable pyrexia. But even when the death of the parasite follows capillary puncture, a simple cyst may remain, or the sac and its contents may undergo steatomatous or calcareous degeneration—results which cannot be considered as altogether satisfactory, when it may be proved that radical cure —*i. e.* the complete evacuation of the contents of the cyst, and the contraction and healing together of its walls—can be effected with less risk of a fatal termination. Case 56 shows how safely the means for the radical cure of the disease advocated in this paper may be employed against a small tumour.

Of 13 cases treated by successive puncture, with or without the injection of iodine (see Table II), there were 8 recoveries, 3 deaths, and 2 cases in which the operation was ineffectual. In two of the cases of recovery iodine injection was employed. In one case (47) ten punctures were required, and the last one followed by a strong iodine injection, and still the cure was incomplete. In two cases (35 and 38) five tappings proved ineffectual, and death was doubtless due to the retention of the accumulated fluid, thus showing the necessity of maintaining a free communication externally.

Of the 30 cases in which the tumour was punctured once or oftener, and an external communication sooner or later preserved (see Table III), there were 23 cures, 18 at least of which may fairly be considered as radical, and

7 deaths, a proportion, notwithstanding the larger size of the tumours, less than that which followed simple puncture. The fatal result in five of these cases is directly attributable to re-accumulation of the discharge or to its retention and decomposition within the sac. The necessity for preserving an opening for the free discharge of fluid from the sac is well illustrated by Case 63.

Of 13 cases in which the tumour was directly incised (see Table IV), there were 6 cures and 7 deaths, a much larger proportion than resulted when the other modes of treatment were adopted; but it will be observed that some of these cases were taken for ordinary abscess, and no means employed to secure the flow of discharge from the sac. Even when a free incision has been made the discharge may most effectually be obstructed by one or more secondary cysts, floated against the outlet. Case 80 shows the advantage of making and maintaining a free opening.

Of 10 cases in which the tumour was opened by caustic potash, or by spontaneous absorption and rupture of the integuments and cyst-wall, there were 3 cures, 3 recoveries, in which the disease continued, and 4 deaths.

Attentive consideration of all the cases in which the tumour has been opened, whether by trocar, by the knife, or by caustic, will still further assure us, on the one hand, that the chances of recovery are in exact proportion to the care taken in the evacuation of the contents of the sac; and, on the other, that the fatal result is due, not to exhausting discharges from a large suppurating cavity, but to a want of care in evacuating the cyst membranes, and thus securing the discharge of fluid which, sooner or later, becomes putrid and poisons the blood. In only one of these 100 cases did the patient die from the exhaustion induced by prolonged discharge from the sac, and in this case the great cyst in the liver was found "full of hydatids and a purulent fluid." (See Case 82.) The advantages of a free opening and the speedy evacuation of the contents of the sac are well seen in Case 56.

In the treatment of hydatid tumours of the liver there

are two other points which deserve consideration, viz., the use of caustic potash and the injection of bile. Careful review of the cases in which the former has been employed, for the purpose of causing adhesion between the sac and the abdominal wall, or with the further object of opening the tumour, will serve to show that it is ineffectual for the first of these purposes (see Case 73), and that it possesses no advantage in effecting the second. Such painful treatment, therefore, may very well be altogether laid aside. As to the injection of bile into the sac, in order to cause inflammatory action within its interior and destruction of the entozoon, it is only necessary to observe that the cyst is so frequently found in direct communication either with one of the branches of the bile-ducts or with the gall-bladder itself as to lead one to the conclusion that the animal enters the liver by the common bile-duct, and that the hydatid tumour is sometimes, at least, formed as a diverticular growth from the walls of some one of its branches within the liver, or, perhaps, within the obstructed portion of the duct itself. In Vol. XVIII, p. 148, of these 'Transactions,' a case is recorded in which the common bile-duct was obstructed near its duodenal end by a hydatid cyst. Dr. Billing records a case ('Med. Gaz.,' vol. vii, p. 542) in which hydatids were found free in the gall-bladder. Jaundice and death has ensued from plugging of the common bile-duct by hydatids. (Dr. Nicholson, 'Med. Times and Gaz.,' 1861, vol. ii, p. 515.) See also Dr. Barlow's case, 'Guy's Hosp. Reports,' vol. vi, ser. 2, p. 185; a case by Dr. Bristowe, 'Path. Soc. Trans.,' 1858; and Case 4, Table I, of this paper.

SYNOPTICAL TABLES OF THOSE CASES OF HYDATID TUMOUR OF THE LIVER IN WHICH CURE WAS ATTEMPTED BY OPERATIVE PROCEEDINGS, INCLUDING THOSE IN WHICH SPONTANEOUS RUPTURE TOOK PLACE EXTERNALLY.

TABLE I.—*Cases in which the cyst was opened by a single puncture, the canula withdrawn, and the opening allowed to close by primary adhesion or otherwise.*

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
1	M. adult	Large tumour of liver. Tapped with ordinary sized trocar, and fluid withdrawn by a double acting stomach-pump syringe, fitted to the canula so as to prevent the entrance of air into the sac	7½ pints of hydatid fluid	Immediate relief. Liver still large from presence of hydatid sac, which, although emptied of its contents, was still of considerable size. No increase of girth two months after, and recovery of flesh and strength	Tumour reduced in size Recovery	G. Budd, M.D., 'Med. Times and Gazette,' 1860, p. 494.
2	M. 56	Large fluctuating tumour occupying the right hypochondriac, the epigastric, and part of the left hypochondriac regions. Tapped with medium-sized trocar, and issue of—	5 pints of thick tapioca-like fluid and broken down hydatids	When seen a fortnight after, there was no reaccumulation, and the patient was apparently quite well	The patient did not remain long enough under treatment to assure us of its ultimate results Recovery	Mr. Holthouse, 'Med. Times and Gazette,' 1860, p. 344.

3	F. 30	Large tumour occupying the right hypochondrium. Puncture with small trocar. The cyst appeared only half emptied when the fluid ceased to run	1 to 2 pints	Inflammation of cyst with presence of air, then slow diminution of tumour, which could not be detected eight months after the operation	Radical cure	Mr. Jonathan Hutchinson, 'Lancet,' 1862, vol. ii, p. 389.
4	F. 15	The whole abdomen distended with a fluctuating tumour. Paracentesis abdominis, and evacuation of—	12¾ pints of brownish and intensely bilious fluid	Temporary relief; reaccumulation of fluid, and death on the 23rd day. The cyst was found to be in communication with the gall-bladder	Death	Dr. Headlam Greenhow, 'Lancet,' 1862, vol. ii, p. 476; Dr. Murchison, 'Ed. Med. Journ.,' 1865, case xiv, p. 513.
5	M. 12	Fluctuating tumour in the right hypochondrium. Tapped with a flat trocar	1½ pint of colourless hydatid fluid	No constitutional symptoms. Recovered and left the hospital in a short time	Recovery	Sir B. Brodie; Mr. Cæsar Hawkins, 'Med.-Chir. Trans.,' vol. xviii, p. 118; Davaine, 'Traité des Entozoaires,' obs. cclviii, p. 569; Budd, G., 'Disease of Liver,' 3rd ed., p. 460.
6	F. 20	Fluctuating tumour of the abdomen connected with the liver. Tapped with medium-sized trocar	3 pints of clear fluid	No bad symptoms. The patient was seen after six years, and there was no return	Radical cure	Sir B. Brodie; Mr. Cæsar Hawkins, 'Med.-Chir. Trans.,' vol. xviii, p. 119; 'Med. Gaz.,' vol. i, p. 334; Davaine, obs. cclix, p. 569; Budd, 'Dis. of Liver,' 3rd ed., p. 460.

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
7	M. 14	Tense elastic tumour of the right hypochondrium. Tapped with a medium-sized trocar—	Upwards of 3 pints of clear fluid	"The wound healed, and the disease probably did not return"	Recovery	Dr. Thompson; Mr. Cæsar Hawkins, 'Med.-Chir. Trans.,' vol. xviii, p. 121; 'Med. Gaz.,' vol. i, p. 468.
8	F. adult	Tumour of liver. Tapping with medium-sized trocar, and removal of—	16 pints of watery fluid	"The result is not mentioned, so that it may probably be concluded that the case ended fatally"	Death (?)	Mr. Cæsar Hawkins, 'Med.-Chir. Trans.' vol. xviii, p. 121.
9	—	Tapping of the anterior of two distinct cysts in liver, and withdrawal of about—	8 pints of watery fluid	Death a few days afterwards. Another cyst containing about 12 pints of clear fluid was found between the liver and diaphragm	Death	Abercrombie, 'Dis. of Stom.,' p. 356; Mr. Cæsar Hawkins, in 'Med.-Chir. Trans.,' vol. xviii, p. 123.
10	F. adult	Fluctuating tumour of the liver. Puncture with common trocar, and removal of—	A washhand-basinful of broken-down hydatids and thick yellowish fluid	Temporary relief, and death shortly afterwards	Death	Dr. Hewett; Mr. Cæsar Hawkins, 'Med.-Chir. Trans.,' vol. xviii, p. 157.
11	Boy	Hydatid tumour of the liver. Tapped with common trocar, and—	12 pints of greenish water evacuated	Death two days after. Gall-bladder contained 8 pounds of bile, the duct was full of gall-stones. A large hydatid cyst of the spleen also existed	Death	'Edin. Essays and Obvs.,' vol. ii, p. 352; 'Med.-Chir. Trans.,' vol. xviii, p. 152.

12	F. adult	A small tumour of right hypochondrium. Punctured with a very fine trocar, and evacuation of—	A small quantity of limpid, salty, non-albuminous fluid.	No bad effects followed, and the patient left the hospital perfectly cured	Cure	Récamier, 'Rev. Méd.,' 1825, t. i, p. 28; Cruveilhier, 'Diction. de Méd. et Chir.,' t. i, Art. "Acéphalocystes," p. 230; Barrier, Thèse, Paris, 1840, p. 57; Davaine, obs. cclvii, p. 568.
13	F. adult, pregnant	Large hydatid cyst on right side of abdomen. Tapped with common trocar, and issue of—	A large quantity of purulent fluid and broken hydatids	Recovered somewhat from the operation, but after 2 or 3 weeks miscarried, sank, and died	Death	Dr. Cholmely; Dr. Bright, 'Abd. Tumours.' Syd. Soc. ed., p. 41; 'Guy's Hosp. Rep.,' vol. ii.
14	F. adult	Fluctuating tumour of epigastrium. Punctured with small trocar, and issue of—	4 pints of limpid colourless fluid	For a long time after, the cyst appeared to refill gradually; at the time the account was closed there was no reaccumulation	Recovery	Mr. Key; Dr. Bright, 'Abd. Tumours,' Syd. Soc. ed., p. 42; 'Guy's Hosp. Rep.,' vol. ii.
15	F. 30	Exploratory puncture below left false ribs, and issue of— 7 days after, a fresh puncture 2 months afterwards, a third puncture, to the right of the umbilicus	About 3 pints of clear fluid Both the second and the last puncture were "without result"	Relief; diminution of tumour. Death 2 months afterwards from extension of another hydatid tumour through the diaphragm and rupture into the lungs. The cyst which had been tapped was diminished in volume	It is not stated whether any communication existed between the two tumours Death	Gonpil, in a Thesis by Cadet de Gassicourt, 'Sur la Rupture des Kystes hydatiques du Foie,' Paris, 1856, No. 50, p. 46; Davaine, obs. lxxvi, p. 447.

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
16	M. 42	Large tumour of right hypochondrium. Punctured with a very small exploratory trocar, and removal of about—	12 ounces of clear fluid	Syncope, rigors, bilious vomiting, collapse, and death 18 hours afterwards. The right lobe of the liver contained a cyst capable of holding about 9 pints	Death	J. Moissenet, 'Arch. Gén. de Méd.,' Fév., 1859, p. 144; Davaine, obs. cclvi, p. 567.
17	F. 19	Tumour of epigastrium. Punctured with capillary trocar	About a pint of clear water	No bad effects followed; the tumour disappeared, and had not returned 3 years after the operation	Radical cure	A. A. Boinet, 'Traitement des tumeurs hydatiques du Foie,' obs. v, p. 13, Paris, 1859; Davaine, obs. cclxii, p. 570.
18	F. 35	Tumour of right hypochondrium. Punctured with capillary trocar	About 4 ounces of clear fluid	Disappearance of tumour; no return after three years	Radical cure	Boinet, op. cit., obs. vi, p. 14; Davaine, obs. cclxiii, p. 570.
19	M. 34	Tumour in region of liver. Punctured by a very fine trocar; 7 days after, application of caustic potash	Limped hydatid fluid, quantity not stated	The tumour was redistended with fluid 3 days after the puncture. The caustic potash did not open the tumour. Nervous symptoms supervened	Death 25 days after the puncture	Récamier; Cruveilhier, 'Dict. de Méd. et de Chir.,' Art. "Acéphalocystes," t. i, p. 235; Davaine, obs. cclxxxiv, p. 590.
20	F. 33	Tumour occupying epigastrium and both hypochondria. Punctured in the epigastrium with a small	More than two pints of clear fluid	Progressed well; the remaining fluid was absorbed; there was no reaccumulation	Scarcely any remains of the tumour 3 months after recovery	Mr. Jonathan Hutchinson, 'Brit. Med. Jour.,' Feb. 20, 1864.

		exploratory trocar, and then, on the issue of a little clear fluid, with one the size of a No. 4 catheter			Cure	
21	F. 36	Large hydatid tumour in right lobe of liver, lifting the lower ribs. Punctured at most prominent part with a trocar the size of a No. 3 catheter	3 pints of clear fluid	At first febrile symptoms from peritonitis or inflammation of the cyst, which became distended and tympanitic. Recovery in 6 weeks, and when seen, some months after, she was wholly free from the disease	Radical cure	Mr. Jonathan Hutchinson, 'Brit. Med. Jour.,' Feb. 20, 1864.
22	M. 46	Tumour distending right hypochondrium and epigastrium. Punctured with trocar the size of a crow-quill at the outer margin of the rectus muscle, 2 inches below the margin of the ribs	6 pints of clear watery fluid	After 3 days, pain in region of the liver and repeated rigors. The febrile symptoms subsided, and a permanent cure resulted in 3 months' time	Cure	Frerichs, 'Dis. Liver,' Syd. Soc. ed., vol. ii, p. 268.
23 and 24	—	Professor Langenbeck communicated two cases of echinococci of the liver treated by simple puncture	—	No history, but both cases are said to have been cured	Cure Cure	Frerichs, loc. cit., p. 269.

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
25	F. 31	Tense fluid tumour of right hypochondrium. Tapped with trocar not quite so large as No. 1 catheter	About 12 ounces clear fluid	Three days after, fever and tympanitic distension of abdomen. Left bed on the 10th day, and the hospital on the 32nd, when the tumour was soft, free from tension, and gradually diminishing. Six months afterwards had almost regained her ordinary health. There was still a fulness in the region of the tumour, but the lower margin of the liver was quite an inch above the umbilicus	Recovery, with a portion of the tumour remaining 6 months after	Charles Murchison, M.D., 'Edin. Med. Jour.,' Dec., 1865, Case 1, p. 503.
26	M. 35	Large tumour of right hypochondrium. Punctured with a grooved needle, and issue of— About 6 weeks after, tapped with ordinary trocar, and issue of—	1 ounce of limpid fluid 23 ounces of limpid fluid	No bad effects followed either operation. After the second, the cyst immediately collapsed and did not refill. 3 months after the operation he had recovered health and strength, and there was no external indication of the former cyst	Cure	Dr. William Budd, 'Brit. Med. Journ.,' 1859, p. 273.

27	M. 37	Fluctuating tumour of epigastrium and right hypochondrium. Puncture of right hypochondrium with capillary trocar and injection of a mixture composed of ʒiss each tinct. iodine and water, and ʒss of iodide of potassium. The injection left in the cyst and the canula withdrawn	About 1½ pint of clear fluid	No pain followed the injection, but an hour afterwards symptoms of iodism and considerable general reaction, which continued for 5 days. Improvement from this time. A month after the operation the prominency of the hypochondrium was very little marked, and the general state satisfactory	Recovery, with a portion of the tumour remaining	Dr. Aran, 'Bull. Thérap.,' Sep., 1854, t. xlvii, p. 218; 'Arch. gén. de Méd.,' 5e série, t. iv, p. 477; Boinet, 'Iodothérapie,' Paris, 1855, p. 396; Davaine, obs. cclxxxviii, p. 595.
28	M. adult?	Hydatid tumour of liver. Exploratory puncture, which gave issue to—	A transparent hydatid fluid	The tumour never reappeared, "and after several years the cure is not to be denied"	Recovery	M. Robert, 'Soc. de Chirurg.,' 18 Mars, 1857, p. 381; 'Gaz. des Hôp.,' 1857, p. 147; Davaine, op. cit., obs. cclxi, p. 570.
29	F. —	A similar case to No. 28, similarly treated	A transparent hydatid fluid	Progress similar	Recovery	M. Robert, 'Soc. de Chir.,' Mars, 1857, p. 381.
30	F. 18	Fluctuating tumour of the epigastric and right hypochondriac regions. Puncture with ordinary trocar, and removal of—	About 1½ pint of faintly greenish watery fluid	For some days prostration and tendency to sickness. In a week substantial recovery. On the 21st day the sac had contracted to half its original capacity. 7 weeks after, the contraction was still more evident, and she was discharged cured in about 3 months after the operation. The patient was seen three months afterwards, and a still further contraction was observable; she remained quite well and able-bodied	Recovery, with some remains of the tumour	W. Brinton, M.D., 'Lancet,' 1862, vol. ii, p. 639.

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
31	F. 40	Growing tumour in left lobe of the liver the size of a young child's head. Puncture with an exploratory trocar two fingers' breadth below ribs in left hypochondrium, removal of nearly— Injection of ʒij of alcohol within the sac, and rapid withdrawal of the canula	2 pints of fluid	The tumour began to reappear 2 days after the operation. On the 3rd and 5th days vomiting; 6th, improvement, but appearance of jaundice; 8th, marked improvement; jaundice disappeared in 5 days, when the tumour had attained its original size. From the 18th day gradual diminution, and 3 months after, no appreciable traces of the tumour	Recovery This patient had previously undergone an operation upon a tumour in the right hypochondrium. (See case 81)	Adolphe Richard, 'Bull. gén. de Thérap.,' 1855, t. xlviii, p. 414; Davaine, op. cit., obs. ccxcvii, p. 606; 'Med.-Chir Rev.,' 1856.
32	F. 28	Fluctuating tumour of the liver. Application of caustic potash to the integuments covering its most prominent part; subsequent tapping of the cyst, and issue of—	2 pints of serous fluid	The day after the operation, jaundice, rigors, and symptoms of inflammation of the cyst. Peritonitis for 6 weeks, slight amelioration, afterwards persistent vomiting, and death. A large hydatid cyst was found in the liver, the intestines were matted together, and the	Death. It appears that no attempt was made to relieve the sac of its contents after the first puncture, and that the hydatid fluid escaped into the peritoneal ca-	Dr. Rogers, 'Brit. Med. Journ.,' 1862, vol. i, p. 71.

				peritoneum was studded with cysts	vity, causing peritonitis, and extension of the disease.	
33	M. 37	Fluctuating tumour in the liver. Puncture with a capillary trocar, and injection of a mixture of ʒiss each of tinct. iodine and water, with ʒss iodido of potassium	1¼ pint of clear watery fluid	Some reaction at first, then diminution of the size of the liver. A month after the operation the prominency of the right hypochrondrium was very little marked	Recovery, with a portion of the tumour remaining	Dr. Aran, 'Des injec. iodées dans les Kystes hydatique du foie Bull. Thérap.,' Sept., 1854, t. xlvii, p. 218; Davaine, obs. cclxxxviii, p. 595.
34	F. 21	A large deep-seated tumour in the right hypochondrium. Punctured with a fine trocar, and a mixture composed of ʒss each of extract of male fern, and solution of caustic potash, and ʒvj of water injected into the sac	ʒiv limpid colourless fluid, containing hooklets	At first febrile action, vomiting and purging. The tumour diminished, and she left the hospital on the 23rd day.	Recovery, with a portion of the tumour remaining	Dr. Pavy, 'Med. and Chir. Trans.,' vol. xlix.

TABLE II.—*Cases in which the cyst was punctured twice or oftener in succession, the opening being allowed to heal up directly after each operation.*

A. *Without injection.* B. *With injection of irritating fluid into the cyst.*

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
35 A	M. 31	Tumour occupying right hypochondriac and epigastric regions, and extending to the left hypochondriac, umbilical, and right lateral regions, the edge being level with the umbilicus. Tapped 5 times within six weeks	About 8 pints of fluid removed at each operation	Relief after the tappings; reaccumulation of fluid. About two months after the first tapping and a fortnight after the last the patient began to expectorate hydatid fluid in large quantities, and died 3 days after. The hydatid cyst in the liver had made an opening in the diaphragm and burst into the lungs	Death. No case could better illustrate the necessity of preserving an external opening, for even after the fifth tapping, the distended sac burst into the lungs	Dr. S. O. Habershon, 'Guy's Hosp. Rep.,' 3rd series, vol. vi, p. 174.

36 A	M. 45	Fluctuating tumour of liver, the size of a child's head. Puncture with an exploratory trocar, and removal of the greater portion of the fluid. After 6 days a second puncture with a larger trocar	About a pint of limpid fluid withdrawn by the first operation. No fluid followed the second puncture	No bad effects followed the punctures, and the patient left the hospital cured	Recovery	Demarquay. A.A.Boinet, op. cit., p. 30; Davaine. obs. cclxiv, p. 571.
37 A	M. 20	Elastic fluctuating tumour of the epigastrium punctured twice, at an interval of 4 months, with a capillary trocar	About a pint the first operation, and 15 ounces the second. Limpid, clear fluid on both occasions	For some time after the first tapping the cure appeared radical, but 4 months afterwards there was a distinct swelling. The second operation appeared to effect a complete cure	Recovery	A. A. Boinet, op. cit., obs. viii, p. 18; Davaine, obs. cclxviii, p. 576.
38 A	M. 26	Swelling on the left side below the ribs, extending across the epigastrium to the right hypochondrium. Tapped 5 times within a month	Quantity not stated; the fluid was at first clear, but on the four subsequent occasions it was purulent	Reaccumulation of the fluid after each tapping. After the last "the liver began to swell," and the patient died 34 days after admission. Large hydatid cyst of the liver containing 4 secondary cysts, each holding a pint of perfectly clear fluid	Death. This case shows how rapidly the fluid may reaccumulate, and it is to be observed that the contents of the sac were purulent when the second puncture was made.	Dr. Willtshire and Mr. Canton, 'Lancet,' Sept. 1, 1860.

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
39, 40, and 41 A	—	Three cases of small hydatid tumours of the liver treated by successive puncture with an exploratory trocar	2 ounces of fluid withdrawn each time	In two cases a gradual diminution in the size of the cyst was to be traced for a long time afterwards. The third case was lost sight of	Recovery, with some portions of the tumour remaining	Frerichs, op. cit., vol. ii, p. 256.
42 and 43 A	—	Two cases of large hydatid tumour of the liver treated by successive puncture with an exploratory trocar	2 ounces of fluid withdrawn each time	Both cases quite unsuccessful; the cysts went on growing without interruption	Operation ineffectual	Frerichs, op. cit., vol. ii, p. 256.
44 A	M. 58	Fluctuating tumour of the epigastrium tapped with a small trocar in median line 2 inches above the umbilicus. 6 days after, tapped a second time	1½ pint of a turbid yellowish fluid the first time; a still larger quantity the second	No relief, and death 10 days after the first operation	Death	Mr. Moreton, of Tarvin, and Dr. Dobie, of Chester; Murchison, 'Edinb. Med. Journ.,' Dec., 1865, case vi, p. 509.
45 A	F. 34	Tumour the size of a child's head below the false ribs on the right side. Puncture with a	After first puncture, 6 ounces of clear limpid fluid. After the second, 6 to 8	2 days after the second puncture, shivering, great febrile disturbance, pain in the epigastric region,	Recovery	M. Jobert, Barrier, Thèse cit., p. 83; Davaine, obs. cclvi, p. 573.

		very fine trocar, and retention of the cannla until the morrow. 9 weeks afterwards, a second exploratory puncture. 3 weeks later, a third was made across an eschar produced by caustic potash. A medium-sized trocar was used this time, and the cannla retained until the morrow. An elastic catheter was introduced on two occasions, the same and the following day, but was not retained	ounces of a similar fluid. After the third, 8 to 10 ounces of a turbid, brownish, purulent fluid	and tenderness of the abdomen. Recovery in 3 days. 4 days after the third puncture the wound was closed, and the discharge was completely suspended. On the 6th day, shivering and fever with pain, tenderness and swelling in the hepatic region. Rapid subsidence of these symptoms; the wound cicatrised in the course of a few days, and the tumour did not increase, but appeared to decrease a little. 7 weeks after the last puncture, she was restored to health and at work, and there was no apparent enlargement of the liver		
46 n	M. adult	Tumour of right hypochondrium, exploratory puncture. Two applications of Vienna paste and puncture through the eschar with a fine trocar and injection of iodine	A clear limpid fluid followed the first puncture; a turbid one the second	Some days after the second puncture the tumour reappeared, febrile symptoms were set up and continued for several months. Ultimately, slow amelioration and cure	Recovery	Chassaignac, 'Gaz. des Hôpitaux,' 1857, p. 147, et "Leçon cliniq.," p. 366, same journal; Davaine, obs. cexc, p. 597; 'Bull. de la Soc. de Chirurg. de Paris,' 1856-7, p. 380.

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks	Reference to author.
47 B	M. 31	Tumour of the hypochondria, punctured with a capillary trocar, and issue of—	From ℥xij to ℥xiv of clear fluid	No bad effects appeared to have followed the punctures, all of which were made with a capillary trocar. The first puncture was followed by a great diminution of the swelling and hepatic dulness, but the others had no apparent effect in diminishing the size of the tumour. No pain was caused by the injection, and 2 months afterwards the patient was discharged cured. At the time of his discharge the liver projected from 2½ to 3 fingers' breadth beyond the margin of the ribs	Recovery, with a portion of the tumour remaining	Dr. Aran, 'Bull. thérap.,' Sept., 1854, t. xlviii; Davaine, obs. ccxcii, p. 599.
		18 days after, a second puncture, and issue of—	about ℥x of turbid liquid			
		32nd day a third puncture, and discharge of—	from ℥iij to ℥iv of slightly turbid fluid			
		60th day a fourth puncture, and issue of about—	℥iv fluid			
		70th day a fifth puncture, and issue of—	about 1¼ pint of reddish-yellow turbid fluid			
		84th day a sixth puncture, and discharge of—	℥ij of turbid fluid			
		95th day a seventh puncture, and issue of about—	1¼ pint of turbid fluid			
		115th day an eighth puncture, and—	no result			
		123rd day a ninth puncture, and issue of about —	℥xiij of turbid sanguinolent fluid			
		140th day a tenth and last puncture; evacuation of—	about ℥x of similar fluid			
		Injection of cyst with a mixture of ℥iss each tinct. iodine and water, and ℥j of iodide of potassium				

TABLE III.—*Cases in which the tumour was punctured, once or oftener, and an external communication established at once or subsequently.*

A. *No injections employed.* B. *Injection of irritating fluids into the cyst.*

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
48 A	M. 31	Tumour of epigastrium and right hypochondrium, encroaching 2 inches to the left of the median line, and below into the umbilical and right iliac regions. Tapped with exploratory trocar midway between umbilicus and cartilage of ninth rib. A month after, tapped again with a small trocar, and two days after with a full-sized trocar; an elastic catheter introduced, and the canula withdrawn	On first tapping, 38 ounces of clear liquid. On the second, 10 ounces of fœtid pus. On the third, 39 ounces of fœtid pus and broken-down hydatids	Discharge of fœtid pus and membranous flakes of hydatids for 3 months. Gradual contraction and disappearance of the sac; healing of the fistulous opening, and cure	Radical cure. It is to be observed that fœtid pus escaped on making the second puncture	Dr. Owen Rees, 'Guy's Hosp. Rep.,' ser. ii, vol. vi, p. 17, 1848-9; 'Lond. Med. Gaz.,' vol. xliii, p. 1101, 1849; 'Bull. de Thérap.,' 1848, t. xxxv, p. 331; 'Arch. gén. de Méd. de Paris,' Juillet, 1849, p. 346; Davaine, obs. cclxvii, p. 576.

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
49	M. 36	Tumour commencing an inch above the umbilicus, and extending over the abdomen. Punctured with a small trocar several times within 11 weeks. Afterwards a small quantity of fluid was drawn off every third day. Ultimately the opening was enlarged with a bistoury, and a large canula introduced	½ a pint of clear fluid followed the first puncture. 4 pints of similar fluid followed the second. About the same quantities of turbid brownish fluid followed the subsequent punctures	The patient progressed favorably, the discharge ultimately became quite purulent and fœtid, but it was only after enlarging the opening that the evacuation of the broken-down cysts was effected, a fistulous opening was established, and the sac slowly contracted	Radical cure	Dr. Babington and Mr. Cock; Dr. Habershon, 'Guy's Hosp. Rep.,' vol. vi, 3rd series, p. 179; 'Med. Times and Gaz.,' 1856.
50 A	M. 15	Prominent fluctuating tumour, the size of a fist, on the right side of the abdomen. Puncture through eschar formed the previous day by caustic potash. An elastic catheter placed in the wound until the morrow	½ a pint of limpid fluid followed the puncture, and the catheter gave issue to a glassful more	Escape of fragments of an hydatid cyst through the wound for a few days. Slight erysipelas of the wound. Subsequently bilious vomiting and fever for some hours. Gradual subsidence of the tumour, cicatrization of the wound, and cure in about three months	No particular care appears to have been taken to keep the wound open, and it opened and closed again several times before it finally healed. The constitutional disturbance was doubtless due to the tem-	MM. Richerand and Jobert; Barrier, 'De la Tumeur hydatique du Foie,' Thèse, Paris, 1840, p. 90; Davaine, op. cit., obs. cclxv, p. 572.

					porary closure of the wound. Cure	
51 A	F. 19	Large tumour of the epigastrium, punctured in the centre with a capillary trocar. 23 days afterwards, a second tapping and attempt to close the wound	On first puncture, 4 ounces of clear fluid. On the second, 6 to 8 ounces of thick fœtid pus	4 days after the first operation, rigors and distension of the tumour, slight tympanites. After the second tapping, the tumour again became distended, and caused the wound to give way on the 5th day, when there was a discharge of air and fœtid pus. The discharge continued for the next 2½ months, at the end of which time the patient was gaining flesh and strength, and the opening was discharging still	Radical cure? In this case the necessity for a free external opening is well seen. It will be further observed that the effect of the first puncture was to convert a clear fluid within the sac into a thick fœtid pus	Dr. Garrod, 'Lancet,' Sep. 1, 1860, p. 210.
52 A	F. 22	Inferior part of right side of the chest distended by fluid supposed to be contained in the pleuritic cavity. Tapped with ordinary trocar	A small quantity of glutinous fluid escaped on puncture	Discharge of similar fluid and hydatid membranes continued; and on the 33rd day after tapping, a large quantity of pus and hydatid membranes came away. She was discharged cured on the 43rd day?	Radical cure? Observation of the case not sufficiently prolonged.	Dr. Goolden, 'Lancet,' Sep. 1, 1860, p. 210.

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
53 A	M. 59	Tumour in epigastric and hypochondriac regions. Punctured with a small trocar; 7 days after, punctured again with a much larger trocar; the canula withdrawn, and a flexible tube the size of the trocar retained in the wound. The tube became obstructed, and was removed 5 days after, and the wound kept open by oiled lint	9 drachms of slightly turbid fluid followed the first puncture, and a little clear fluid and hydatids the second	After the insertion of the tube, only a little discharge oozed from the sac by the side of the catheter, and there was some constitutional disturbance. The tube was blocked up by a collapsed hydatid. After the removal of the tube, broken hydatids and fœtid pus continued to be discharged for about 5 weeks, gradually decreasing in quantity. On the 79th day from the first puncture, he was in perfect health, and a cord-like cicatrix occupied the place of the former opening	Radical cure	Dr. Owen Rees, 'Lond. Med. Gaz.,' vol. xliii, p. 1101, 1849.
54 A	M. 42	Enormous tumour occupying the epigastric and hypochondriac regions, and reaching as low as the umbilicus. Tapping with a trocar; and 10 days	At the first operation, only a little pus was obtained by means of a cupping-glass. At the second operation, offensive	In the interval between the first and second operations, the tumour increased in size, and the presence of air was manifest. Inflammatory symp-	The cyst in this case was not permanently relieved of its contents. Putrid fever ap-	Mr. Hilton, 'Lancet,' 1851, vol. i, p. 353.

		after, an incision, ¾ inch long, was made down to the cyst, and a trocar and canula then plunged into it. A plug of lint was placed in the wound	gas and a number of hydatid cysts were removed; and 5 days afterwards, 1½ pint of purulent fluid was discharged	toms supervened. After the second puncture, hydatids were freely discharged with purulent fluid. The patient lingered for a few days, and died about three weeks after the first operation. An hydatid cyst, full of putrid hydatids, was found in the left lobe of the liver	pears to have been set up, resulting in death	
55 A	M. 12	Fluctuating tumour in the hepatic region. Incision and evacuation of— The lining membrane of the cyst was withdrawn by gentle traction	8 pounds of clear fluid	Inflammation and suppuration of the cyst followed the complete evacuation of its contents, and the cure was completed in 10 weeks	Radical cure promptly effected by the rapid and complete evacuation of the cyst	Dr. A. Monro, 'Morbid Anatomy of the Gullet;' 'Prov. Med. and Surg. Journ.,' vol. xiv, 1850, p. 394.
56 A	M. 56	Small hydatid tumour of the liver, occupying the epigastric and right hypochondriac regions. Exploratory puncture with grooved needle. The following day, a crucial incision over the most prominent part of the tumour; and after the flaps were dissected back, caus-	A little viscid serum containing hooklets was obtained by the grooved needle, and one ounce of viscid substance, consisting of broken hydatids and serum, was obtained at the time of tapping	Considerable pain and restlessness followed the introduction of the trocar. After the opening was dilated, from ʒiv to ʒviii of sanguinolent viscous matter, crowded with hydatid cysts, were discharged daily for 10 weeks, during which time the patient remained in a very	This is a capital illustration of the progress towards radical cure in the case of a small tumour. It also shows the necessity of evacuating the contents of the cyst as	J. Hughes Bennett, M.D., 'Princ. and Prac. Medicine,' 4th Edit., p. 522.

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
		tic potash was applied to the subjacent tissue. On the 9th day, a second application of the caustic. On the 11th, a trocar and canula, ½rd inch in diameter, were passed through the slough into the tumour, and a scooped director used to evacuate its contents. 16th day, dilatation of the wound, and the insertion of tents of lint to preserve the opening		weak condition. A tough membrane was subsequently evacuated, and henceforward the discharge rapidly decreased, and in about 14 weeks from the time of puncture with the trocar the wound was quite healed. A month afterwards there was no trace of any hepatic tumour, and the patient was in perfect health	soon as possible. After the discharge of the membrane lining the parent cyst, there was a speedy recovery. Radical cure	
57 A	M. 10	Hydatid tumour of the liver tapped with a large trocar, and the opening preserved	Discharge of a large quantity of turbid fluid and cyst-wall	Portions of cyst were subsequently discharged in larger quantities, and the patient made a good recovery	Cure, probably radical	Dr. Hjaltalin; Dr. Leared, 'Path. Soc. Trans.,' vol. xiv, p. 176.
58 A	F. 31	Fluctuating tumour commencing in the right hypochondrium, and extending over the whole of	On first tapping, only a few ounces of pus; a few hours after, 16 pints of purulent	Immediate relief, rapid recovery of health and strength. The discharge gradually decreased to a	If we accept the patient's statement that the tumour com-	A. Copeland Hutchison, 'Practical Observations in Surgery,' London, 1816, p. 145.

		the abdomen; most prominent part a little to the right of the ensiform cartilage. Puncture with large-sized trocar, and retention of the canula. Introduction of a probe through the canula to push away or rupture the secondary cysts. Canula stopped with a cork during daily intervals. Removal of the canula after five days, and substitution of a sponge-tent	fluid and hundreds of small hydatids. Subsequently the daily discharge of large quantities of fluid	few drachms daily. More than 18 months after the operation, nearly 2 quarts of healthy pus, free from hydatids, were discharged. A year afterwards, a fistulous opening remained, but there was no appreciable discharge	menced in the right hypochondrium, and take into account the upward displacement of the diaphragm and the deficiency of bile in the fæces, we may assume that the disease had its origin in the liver; but no mention is made of the condition of that gland Radical cure	
59 A	M. adult	Large fluctuating tumour bulging the right hypochondriac and epigastric regions, supposed to be an abscess. Incision through the integuments covering the most prominent part of the tumour, and puncture of the cyst with a full-sized trocar, and evacuation of— Canula withdrawn, and opening closed with sticking-plaister	6 pints of seropurulent fluid and small hydatids	Pain and febrile symptoms followed the 1st operation, and on the 7th day the tumour had regained its previous size. The same occurred after the second puncture, and, although one puncture at least remained open, after the 13th day it was necessary to make the other openings in order to give vent to accumulating fluid, and it was only after the	This case illustrates very completely the dangers resulting from obstruction of the discharge, and the advantages of making free openings into the sac Radical cure	H. C. Sherwin, 'Edin. Med. and Surg. Journal,' 1823, vol. xix, p. 228.

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
		On the 7th day, second puncture an inch higher with a very large round trocar, and the withdrawal of— This opening was also healed On the 13th day, trocar introduced a third time, and the canula retained and plugged On the 24th day a fourth tapping, and on the 32nd day a fifth tapping, were resorted to, and— On the 39th day, an incision an inch long was made between the 9th and 10th ribs, behind their angles, and a large round trocar introduced in a direction pointing to the scrobiculus cordis. The canula was retained for 10 days, a thick piece of wax bougie was then substituted	10 pints of sero-purulent fluid and hydatids 8 pints of purulent fluid and hydatids were obtained by the third operation Several pints of purulent fluid removed 6 pints of very fœtid pus and some larger hydatids, and towards the end a little bile, were obtained by this last puncture	6th operation that this was sufficiently secured. The discharge then rapidly decreased, the sac contracted, and the patient recovered his health and strength and returned to his work 3 months after the operation. 7 weeks after this date, the sac was entirely obliterated, and nothing remained but a slight fistulous opening		

60 A	M. 38	A large circumscribed fluctuating tumour in the right hypochondrium, extending to the umbilical region. Previously to the operation, jaundice, great pain in the tumour, shivering, and increase of the tumour. Puncture, and the application of poultices to the punctured part	A gallon of thin, purulent, offensive matter and hydatids followed the withdrawal of the instrument	Hydatid membranes and a yellowish green tenacious fluid continued to be discharged. Tenderness and pain in the tumour increased, and the patient died on the 26th day after the operation. An immense cyst, full of numerous large hydatids, was found in the right lobe of the liver	No means appear to have been adopted to secure the evacuation of the contents of the cyst, and the fatal result is attributable to retention of the discharge Death.	John Elliotson, M.D., F.R.S., 'Lancet,' vol. i, 1832, p. 756.
61 A	F. 20	Painful tumour in the right hypochondrium, indistinctly fluctuant. Puncture, and withdrawal of—	10 ounces of bloody pus and hydatids	Relief. The puncture was healed on the 3rd day, and the tumour refilled. On the 11th day the integuments gave way, and a considerable quantity of matter was discharged. On the 17th day the opening was healed and the cyst contracted	In this case the accumulated fluid produced sufficient distension to effect spontaneous rupture, and the safety of the patient was thus secured. Cure	Dr. Cholmeley, 'Lancet,' 1826.
62 A	F. 62	Tumour of the liver extending from the right lumbar region across the abdomen to 2 inches left of the umbilicus, and upwards as far as the 7th rib. Puncture, and the opening preserved by lint tents and simple dressing	4 pints and a few ounces of offensive pus and hydatids followed the withdrawal of the instrument	At first moderate febrile action, but on the 4th day it had ceased, and the patient was in a very favorable condition, and there was great discharge from the wound	The history stops short on the 4th day; but from the plan of treatment adopted and the freedom of the discharge, it is probable that the patient recovered	Dr. Roberts, 'Lancet,' 1834, vol. i, p. 189.

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
63 A	M. 25	Fluctuating tumour of the right hypochondrium. Two applications of Vienna paste; puncture through the eschar with an ordinary trocar. A second puncture 3 months afterwards; closure and cicatrization of the opening. Subsequent rupture thro' the cicatrix, and establishment of a fistulous opening	$5\frac{1}{4}$ pints of clear fluid followed the first puncture. Pus and broken-down hydatids followed the second	Reaccumulation took place after both punctures. The spontaneous rupture was followed by the discharge of fœtid fluid and hydatids. Exhaustion and death 5 months from the time of the first operation. A hydatid cyst, the size of an adult's head, and a second smaller one, were found in the liver	Even the ruptured opening was insufficient to secure the evacuation of the contents of the cyst, and no means appear to have been used to evacuate the secondary cysts. Death	Cruveilhier, 'Gaz. des Hôpit.,' 1842, 2e séries, t. iv, p. 317.
64 A	M. 38	Tumour of epigastrium, exploratory puncture. Two applications of caustic potash, and eight days after the last one incision through the eschar. A month afterwards a fresh puncture, and the opening preserved by means of a sponge-tent	A little clear fluid followed the exploratory puncture, and half a pint of turbid serosity the incision. On making the last opening, a most fœtid fluid and hydatids escaped	On the 22nd day the tumour had nearly disappeared, but the patient continued in an unsatisfactory state. On the 45th day the belly was still a little painful and distended. The last opening produced immediate relief; a free outlet was maintained, and the patient progressed satisfactorily, and the cyst was diminishing every day	Radical cure	Récamier, 'Lond. Med. Gaz.,' vol. ii, p. 573, 1828, 'La Clinique,' May 6. 1828 (?); 'Lancet,' 1827-8, vol. ii, p. 327 (?).

	65 A	F. adult	A case of supposed hydrothorax. Puncture between the lower false ribs of the right side, and a tent placed in the wound	Fluid and hydatids	The patient died very quickly. The thoracic organs were healthy, but the liver was in great part destroyed by a hydatid cyst	Death	Ruysch, 'Obs. Anat. Chirurg.,' obs. lxv, p. 61, cit. par Lassus. Mém., cit., obs. v; Cruveilhier, op. cit., p. 229; Davaine, obs. cclxxv, p. 581.
	66 B	M. 30	Circumscribed tumour of the right hypochondrium. Exploratory puncture, and— 6 applications of caustic potash; incision of the eschar, and evacuation of— A tent placed in the wound. Occasional introduction of an elastic catheter, and washing-out of the cyst. Injection of tincture of iodine	Issue of about 4 ounces of watery fluid. 1¾ pint of turbid, fetid, yellowish serosity	After the puncture, there were vomiting, fever and exquisite sensibility of the belly. These symptoms abated, but returned with great severity after the 6th application of caustic potash, and the tumour increased in size. The patient remained in a precarious state after the incision, but 3 months subsequently he had regained his flesh and strength. The fistula gradually closed, and the patient was cured in about 4 months	Radical cure	Robert, 'Bull. gén. de Thérap.,' Paris, 1843, t. xxv, p. 379; Davaine, obs. ccxciv, p. 601.
	67 B	F. 8½	Tumour of epigastrium, capillary puncture, and removal of about— 16th day, a second puncture, with medium-sized trocar; issue of— Injection of iodine; soon	2 pints of clear hydatid fluid 2 pints of green purulent matter 2 pints of fœtid	No bad effects followed until the 10th day, when, the sac having refilled, severe febrile symptoms supervened. The second operation gave complete relief, but as the sac filled	Radical cure. In this case the tumour, although small, twice became redistended, and it was necessary	Dr. Boinet, 'Gaz. hebdomad. de Méd. et de Chir.,' sér. 2, 1864, tom. i, p. 86. The author records another successful case similarly treated in the 'Gaz. Méd.,' 1860.

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
		after, application of caustic potash and chloride of zinc. 42nd day, puncture with a very large trocar, and evacuation of— Insertion and retention of a large elastic catheter. 49th day, another large puncture made into the cyst and drainage tubes kept in both openings. 64th day, incision into the cyst, and withdrawal of its contents	greenish pus and broken-down hydatids	again the dangerous symptoms reappeared. As soon as the external opening was freely established all went on well, and after the removal of the cyst membranes by incision the sac speedily contracted, and was completely obliterated on the 110th day	to establish a free external opening	
68 B	M. 33	Large tumour of right hypochondrium raising the walls of the chest, punctured with a common trocar, and issue of— The flow being arrested, the sac was opened at once with a bistoury and a dilator introduced. The sac was repeatedly injected with iodine	Several spoonfuls of pus and a hydatid. On making the incision, about 2 pints of pus and hydatid membranes were evacuated	The patient went on satisfactorily for nearly a month after the operation. Subsequently he had shivering, fever and fœtid stools, and died on the 42nd day. The punctured cyst contained yellowish brown liquid and two hydatids. It communicated with another cyst which occupied nearly the whole of the right lobe of the liver and extended through the diaphragm to the right lung	No mention made of any continuance of the discharge; but a month after the operation an hydatid was withdrawn from the wound; some very fœtid grumous discharge followed. Death	Mesnet and Boinet, 'Revue méd.,' 15 Février, 1853; 'Bull. Soc. Chir.,' 1852; Boinet, op. cit., p. 387; Cadet de Gassicourt, Thèse cit., p. 76; Davaine, obs. cexci, p. 597.

69 B	F. 27	Hard tumour on right side of abdomen. Exploratory puncture and evacuation of— 2 days after, application of Vienna paste nearly midway between false ribs and crest of ileum. Repeated until the cyst burst spontaneously. This occurred on the 22nd day Injection of tinct. iodine through an elastic catheter. On the 24th day, removal of catheter and enlargement of the opening by a bistoury, and repeated injection of iodine	4 pints of clear fluid. Discharge of 4 pints of a reddish fluid	Rigors and rather severe fever, with bilious vomiting, came on after the first injection of iodine, but soon ceased. The contents of the cyst were gradually evacuated. The patient's state continued to improve until rather more than 3 months from the first puncture, and she was discharged cured	Radical cure	M. Demarquay, 'Gaz. Méd. de Paris,' Sept. 16, 1865; 'Brit. Med. Journ.,' Dec. 16, 1865, p. 642.
70 B	F. 16	Fluctuating tumour of right hypochondrium. Several applications of caustic potash; exploratory puncture, and 12 days after, puncture with a large trocar. Next day dilatation of the wound with prepared sponge. Injection of iodine on the 20th day. On the 28th, solution of nitrate of lead; and subsequently chlorinated water twice a day	2 spoonfuls of clear fluid followed the first puncture, 4½ pints of clear limpid fluid the second. Next day, fragments of hydatid cyst	Free discharge, at first of bilious fluid. On the 12th day it was purulent. In 2½ months the fistulous opening discharged only a few drops of serosity, and at the end of 4½ months she was perfectly cured and the fistula had healed	Radical cure	Laboulbène; Davaine. obs. cclxxxiii, p. 588.

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
71 B	M. 36	A tumour of considerable size in the hepatic region. Application of caustic potash until it was assumed that adhesions had taken place, then tapping with ordinary trocar. The sac washed out with water, injected with iodine, and an elastic catheter inserted and kept in the wound. Iodine and chlorine injections frequently used	$1\frac{3}{4}$ pint of pus	The patient progressed well. Pus and débris of hydatids continued to be discharged. On the 11th day, bile was mixed with the pus. From the 13th to the 19th day, the discharge consisted of pure bile. Left the hospital on the 60th day, the fistulous orifice discharging a little pus. 5 months afterwards, the fistula was closed, the wound cicatrized, and the general health excellent	Radical cure	M. Nélaton; Cadet de Gassicourt, Thèse cit., obs. iii, p. 13; Davaine, obs. cclxxxix, p. 596.
72 B	F. 34	Fluctuating tumour of right hypochondrium. Three exploratory punctures at intervals of 20 days, and evacuation of about— Afterwards, 3 applications of Vienna paste; and on the 38th day after the last puncture, an opening	8 pints altogether of fluid; clear and albuminous on two occasions, purulent on the last. $3\frac{3}{4}$ pints of pus followed the fourth puncture	No bad symptoms followed the first two punctures; the third induced shivering and fever. Capillary punctures proved insufficient to produce contraction of the tumour. Some days before the wound was enlarged, grave febrile symptoms appear-	Radical cure. This case shows the insufficiency of repeated capillary punctures for the removal of a tumour of very moderate size	Demarquay, 'Gaz. des Hôpitaux,' 19 Février, 1859, p. 82; Davaine, obs. ccxcv, p. 603.

		was made with a bistoury, an elastic catheter introduced, and injections of iodine and perchloride of iron employed from time to time. On the 62nd day the opening was enlarged by a bistoury; withdrawal of the catheter on the 86th day		ed. This operation was followed by the ejection of pus and débris of hydatids, and an abundant flow of blood. 6 months after the first puncture, the patient was in a satisfactory state, and may be considered as cured		
73 B	F. 27	Tumour of right hypochondrium. Application of Vienna paste at intervals. 8 days after the last application, puncture with cataract needle. 3 days after, puncture with ordinary trocar through the eschar. The canula was withdrawn, but replaced again on the 5th day; but being too fine to allow a free flow, another puncture was made on the 8th day. Iodine injections were used on the 5th and subsequent days	5½ pints of very fœtid pus followed the second puncture; no fluid followed the third	Severe diaphragmatic peritonitis followed the exploratory puncture. No bad effect followed the tappings, but the flow of fluid was obstructed and the cyst became distended. On the 11th day febrile symptoms set in, and on the 12th the patient died. There was no adhesion between the abdominal wall and the cyst, which contained 5¼ pints of purulent serosity and hydatids. There was pus in the neighbouring hepatic veins	Death. 3 applications of Vienna paste at intervals of 3 days failed to produce adhesion of the sac	F. Dolbeau, 'Sur les grands Kysts du Foie,' Thèse, No. 113, obs. i, p. 25, Paris, 1856; Davaine, obs. ccxcvi, p. 604.

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
74 B	F. 53	Fluctuating tumour distending the lower ribs of the right side. Application of Vienna paste between the 8th and 9th ribs; 2 days afterwards, puncture through the slough with an exploratory trocar; 3 days after this, puncture with a large trocar, injection of bile morning and evening, and retention of the canula	After exploratory puncture, issue of clear water and minute hydatids. After the second puncture 3½ pints of straw-coloured clear fluid	The patient did well up to the 8th day, when the discharge failed; the next day there was diarrhœa and some fœtid discharge from the sac; fever and pneumonia followed, and the patient died on the 36th day. The cyst contained fluid and hydatids; there was some pneumonia of the left lung, calculi and distension of the gall-bladder, and ulcerations of the duodenum and small intestine	Death	Auguste Voisin, 'Bull. Soc. Anat.,' Paris, 1857, ann. xxxii, p. 132; Davaine, obs. ccxcviii, p. 608.
75 B	M. 29	Very large fluctuating tumour extending from the epigastrium over the whole of the abdomen and into the lower part of the chest, displacing the lungs and heart. Puncture with No. 11 trocar; maintenance of the opening by the	Discharge of 19½ pints of fluid, the greater part bright and clear as water, the latter portions tinged yellow and turbid from the presence of bile: and also a number of minute	Great relief and favorable progress, occasionally interrupted by distress and febrile symptoms due to retention of the discharge by the broken-down cyst-wall. Excepting at these times, the discharge was very profuse	Radical cure	Synopsis of the case related in this paper. 'Med. Times and Gaz.,' 1866, vol. i, p. 482; 'Lancet,' 1866, vol. i, p. 538; 'Gaz. Méd. de Lyon,' 1866.

		canula and by elastic catheters. Gradual dilatation of the passage by means of elastic catheters. Injection of a large quantity of iodine, and a daily cleansing of the cyst with a solution of zinc and creasote water	hydatid vesicles	and amounted to many gallons. For 21 weeks from the day of tapping, the discharge contained a considerable quantity of bile. On the 51st day there was hæmorrhage from the liver. On the 75th day the whole of the contents of the cyst were evacuated, and from this time the discharge decreased and cyst contracted, and ultimately disappeared		
76	F. 26	Fluctuating tumour of the upper part of the abdomen. Destruction of the integuments by caustic potash, and puncture of cyst with a capillary trocar; closure of the orifice and reopening by means of a bistoury, and insertion of an elastic catheter; frequent injection of iodine and alcohol. Catheter retained for four months	16 ounces by the first operation; 1¼ pint by the second	Intense general symptoms after the second operation. Subsequent evacuation of a great number of fragments of hydatid cysts. Closure of the fistula, and recovery of health in about 5 months from the first operation	Radical cure	M. Leudet, 'L'Union Médicale,' 1859, No. 90, p. 202.

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
77	F. 17	Hydatid tumour of the right hypochondrium. Incision down to the peritoneum, 7 days after, puncture with a flat trocar, and the wound closed. A second puncture on the 10th day, and the cannula retained	2 pints of watery colourless fluid by the first puncture. ʒiv yellowish-brown turbid fluid by the second	Severe febrile symptoms followed the first puncture. Purulent fluid and hydatid membrane continued to be discharged. The tumour gradually subsided, and the fistula closed	Cure. The patient died 5 months after of phthisis	Ried and Brehme, 'Deutsche Klinik,' No. 39, p. 377 and 386.

TABLE IV.—*Cases in which the tumour was directly incised without previous puncture, or (excepting Case 89) the application of caustic potash, and an external communication preserved.*

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
78	M. 28	Fluctuating tumour of the posterior and inferior part of the right side of the chest. Incision about 1½ inch long between the third and fourth false ribs, in the centre of the tumour	At first limpid fluid; afterwards a great quantity of yellow pus, and for the next 12 days several hydatids with a great quantity of pus	15 days after the operation, precordial anxiety, painful cough and expectoration of hydatids. This continued to the 43rd day. On the 72nd day, the wound was reduced to a small fistulous opening, with only a slight suppuration of a healthy character, and the condition of the patient was improving from day to day	Radical cure	Fréteau, 'Journ. gén. de Sédillot,' t. xliii, p. 121; Cruveilhier, 'Dictionnaire de Méd. et de Chir. pratiq.,' t. i, art. 'Acéph.,' p. 249 (extract); Davaine, op. cit., obs. xxxiv, p. 415.
79	M. 37	Very large fluctuating tumour of the epigastrium and lower part of abdomen. Opened by incision with a scalpel 3 inches below the ensiform cartilage. The discharge being obstructed two days afterwards, the canula was again introduced into the wound	At first about 9 pints of fluid were evacuated. On reintroduction of the canula, 4 pints more	At first, relief; but, two days after the operation, return of the dyspnœa. After the reintroduction of the canula, there was a constant oozing until death, which took place 9 or 10 days afterwards. The cyst was found to contain nearly 14 pints of bloody serum, and there were 8 pints of viscid bilious fluid in the peritoneal cavity	Death. The fatal result was clearly due to overflowing of the fluid from the distended sac into the peritoneal cavity	Dr. Hastings, 'Midland Medical Reporter,' Aug. 1829; 'Trans. Med. and Chir. Soc.,' vol. xxiii.

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
80	M. 36	Fluid tumour of the epigastrium opened by an incision 2 inches long between the umbilicus and ensiform cartilage. A pledget of lint was placed in the wound	At first a quantity of hydatids and fluid equal to 12 pints	Progressed well; fluid and cyst-wall continually escaping. The fluid became extremely fœtid, and a month after the operation the patient was very weak. During the second month there was about a pint and a half of discharge each day. Diminished to 2 ounces during the next month. At the end of 5 months a slight discharge. Three years after the operation, the patient was in fair health	Radical cure	J. Russel, 'Dub. Journ. Med.,' Nov. 1837; 'Archives gén. de Méd.,' 1838, t. 1, p. 106; Davaine, obs. cclxxi, p. 578.
81	M. adult	Supposed abscess on the right side of the abdomen. Incision	Discharge of a great number of vesicles, it is assumed, with a yellowish fluid	The discharge of hydatid cysts continued for several days. The patient was perfectly cured	Cure	Rivière; Cruveilhier, 'Diction. de Méd. et de Chir. Prat.,' t. i, Art. "Acéphalocystes," p. 223.
82	M. adult	Tumour, right hypochondrium, increasing for 6 years, and causing much distress. It was taken for an abscess and incised	A great quantity of hydatids, accompanied by a thick viscid matter	More than 300 hydatids came away at different times. The patient was worn out, and died after a year. The great cyst in the liver was full of hydatids and a purulent fluid	Death	Camerarius; Cruveilhier, op. cit., p. 224; 'Boneti Sepulchretum,' p. 1532.

83	M. adult	Tumour in the hepatic region mistaken for an abscess, opened by incision	Discharge of hydatids and fluid immediately, and for 5 days after	The patient grew weaker and weaker, and died on the 5th day	Death	Panaroli, obs. xvi, cit. par Lassus, 'Rech. et Obs. sur l'Hydropsie enkystées du Foie;' Davaine, obs. cclxxiv, p. 581; Cruveilhier, op. cit., p. 225.
84	M. adult	Tumour of the epigastrium taken for an abscess. Incision	About 2 pints of limpid serosity	Watery fluid continued to be discharged, and there was constant hiccup and vomiting, and death on the 3rd day	Death	Sue; Lassus, Mém. cit., obs. ix; Davaine, obs. cclxxvi, p. 581; Cruveilhier, op. cit., p. 225.
85	M. 62	An enormous hydatid cyst of the liver distending the right hypochondrium, opened by a bistoury	A great number of hydatids and much yellow purulent fluid discharged	The patient died three days after the operation	Death	Récamier; Briançon, 'Essai sur le Diagnostic et le Traitement des Acéphalocystes,' Thèse de Paris, 1828, p. 16; Davaine, obs. cclxxvii, p. 582.
86	F. 47	Fluid tumour of right hypochondrium opened by two incisions; the first down to the peritoneum; and 4 days after this, the second was carried through this membrane into the cyst. The wound was kept open by a tent, and detergent injections were thrown into the cyst	Much yellow fluid was evacuated	A sero-purulent fluid continued to be discharged; but fever ensued, and the patient died soon afterwards	Death	Rayer and Velpeau, 'Bull. gén. de Thérap.,' 1844, t. xxvi, p. 58; Davaine, obs. cclxxviii, p. 583.

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
87	M. 35	Large tumour of the liver pointing in the right hypochondrium. Incision, a tent placed in the wound, and removed each day	A sero-purulent inodorous liquid, and a great number of hydatids	The discharge became fœtid, and the cyst distended, on the 5th day, and the patient died on the 6th. There were 4 cysts in the liver, and the omentum was strewn with cysts from the size of a nut to that of a fist	Death. Long before the tumour was opened the patient had had several severe attacks of sharp pain	M. Pinault; Cruveilhier, op. cit., p. 226.
88	F. 29	A small tumour of the liver opened by incision, first down to the peritoneum, and three days after into the cyst. The wound kept open by a plug. The discharge of hydatids facilitated by traction with a forceps. Injection of marshmallow water from the 8th day	About a pint of clear citrine-coloured fluid at first, and about 6 ounces each day for the next 3 weeks	Day after the operation, fever, abdominal pain, and discharge of brownish fluid; afterwards, evacuation of hydatid cysts and bilious yellow fluid. Retraction of the tumour, and after six weeks the patient was progressing towards cure	Cure	Jarjavay, 'Gaz. des Hôpitaux,' 1850, No. 89, p. 353, and No. 100, p. 397; Davaine, op cit., obs. cclxxix, p. 583.
89	M. 33	Tense tumour of epigastrium and right hypochondrium. Application of caustic potash below	A pint of limpid fluid	Progressed well for a month; the sac discharging fluid and cyst-wall, and contracting. Then	Radical cure	M. Récamier; Debouis, Thèse de Paris, 1828, No. 263.; Barrier, Thèse cit., p. 81; Cruveilhier,

		the ensiform cartilage; incision through the eschar, and injection of emollient fluid. After a month, enlargement of the wound		arrest of discharge, great abdominal pain, tympanitis, increase of the tumour, and dyspnœa. After the wound was enlarged, an issue of a great quantity of fœtid pus, and a little sero-pus. Great relief; and two days after, discharge of cyst-wall, and increase in the flow of yellow-coloured fluid. Uninterrupted progress, and at the end of 11 months the cyst was contracted to the capacity of an ounce. Discharged cured 5 days afterwards		Art. "Acéphalocystes," p. 236 (?); Davaine, obs. cclxxxi, p. 586.
90	M. 18	Considerable tumour of the epigastrium and right hypochondrium. After an exploratory puncture, an incision. Injection of water and alcohol into the cyst, and retention of an elastic catheter	Discharge of serous fluid, and a considerable quantity of hydatids	At the end of 2 months, 60 to 80 minute hydatids were discharged at each dressing, and the patient was going on well	Cure. The liver was incised to the depth of from 1 to 1½ in., in order to reach the cyst	M. Jobert, 'Gaz. des Hôpitaux,' Août, 1833, p. 383; Davaine, obs. cclxxxii, p. 587.
		Another successful case of incision is recorded by—				E. Alexander, 'Boston Med. and Surg. Journ.,' vol. xviii, 1838.

TABLE V.—*Cases in which the tumour was opened wholly by caustic potash, or by spontaneous rupture.*

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
91	F. 40	Enormous hydatid cyst of the right lobe of the liver. After seven applications of Vienna paste upon the centre of the right hypochondrium, the cyst gave way on the 7th day	Issue of 5 pints of puriform fluid and hydatids	Rapid amelioration; discharge through the fistulous opening for 5 months, and completion of the cure	Radical cure	Adolphe Richard, 'Bull. gén. de Thérap.,' 1855, t. xlviii, p. 414; Davaine, op. cit., obs. ccxcvii, p. 606; 'Med.-Chir. Rev.,' 1856.
92	M. 20	Painful tumour of the right hypochondrium. Two applications of caustic potash to the most prominent part of tumour, and spontaneous opening of the cyst. Emollient injection to prevent entrance of air	Issue of 10½ pints of yellowish limpid fluid, with hydatids of every size	No bad symptoms; discharge of hydatids and fœtid fluid continued, and in 3 weeks' time the sac had contracted to the capacity of 4 ounces; but it subsequently became distended with matter resembling that contained in the end of the small intestine, and fragments	Radical cure	Récamier, 'Clin. Méd. de l'Hôtel-Dieu de Paris,' 1827; 'Lancet,' 1833, vol. i, p. 739; L. Martinet, "Obs. d'un Kyste hydat. du Foie," 'Revue Médicale,' t. iii, p. 436 1827; Barrier, Thèse cit., p. 58; Cruveilhier, op. cit., Art. "Acéphalocystes," p. 231; Duputyren, 'Journ. Hebd.

				of the food were observed in the discharge. These soon ceased to pass, and the patient went out of hospital in about 10 weeks from the opening of the cyst, with only a slight fistulous orifice		de Méd. et Chir.,' t. iii, p. 390; Davaine, op. cit., cclxxx, p. 585.
93	F. 20	Large tumour of right hypochondrium, causing tension and ulceration of the abdominal walls	Discharge of clear fluid and hydatids	Recovery	Recovery	F. Plater, 'Observat. selectæ,' obs. xviii, p. 44; cité par Cruveilhier, Art. "Acéphalocystes," p. 223; Davaine, obs. cxlv, p. 508.
94	M. 34	Tumour of right hypochondrium, diagnosis confirmed by exploratory puncture. Application of caustic potash, after which Canquoin's paste (chloride of zinc) for 9 days successively, until the cyst was opened	9 pints of yellow fluid	After rupture of the cyst and evacuation of its contents, the discharge was arrested to prevent hæmorrhage into the cyst. This, however, occurred on the 3rd day, and the patient sank on the 4th day, after the cyst was opened	Death. No hooklets could be found in the discharge before death, or in the body at the post-mortem examination	M. Gayet, 'Gaz. Méd. de Lyon,' 15 Mai, 1865; 'Brit. Med. Journ.,' vol. i, 1865, p. 650.
95	F. 50	Fluctuating tumour in the hepatic region; reddening of the integuments, and spontaneous rupture at the umbilicus	Discharge of liquid pus and a great number of hydatids	The discharge continued a month, and death then took place from exhaustion	Death	Frerichs, 'Dis. Liver,' Syd. Soc. Ed., vol. ii, p. 237.

No.	Sex and age.	Situation of the tumour and treatment.	Nature and quantity of fluid withdrawn at the operation.	Progress.	Result and remarks.	Reference to author.
96	F. 42	An hydatid tumour burst through the umbilicus and discharged— 3 years afterwards, the epigastric and right hypochondriac regions again swelled and became painful. The tumour was incised at a red prominent point in the hypochondrium	A pailful of a peculiar gelatinous matter Issue of blood and pus	Sanious matter and cyst-wall continued to be discharged, and a fistulous opening remained for nearly three years. 17 years after the spontaneous rupture of the cyst she came under notice, when both apertures were found open and the surrounding parts slightly retracted to them. The whole of the proper substance of the right lobe of the liver was converted into a thick cartilaginous mass partially ossified, and imbedded therein was a large cyst containing a pint and a half of fluid and hydatids of various sizes	Spontaneous rupture of the cyst, and subsequent puncture ineffectual for destroying the animal. The patient died of albuminuria and uræmia	J. W. Griffiths, M.D., F.L.S., 'Lond. Med. Gaz.,' vol. xxxiv, p. 585, 1844.
97	F. adult	Large hydatid tumour of liver bursting through the abdominal walls immediately below the umbilicus	Enormous discharge of fluid, and subsequent evacuation of an hydatid cyst capable of holding 12	Exhaustion and death in about 4 days. The large cyst was situated on the under surface of the liver, where was found a	Death	Dr. Bright, 'Mem. Abd. Tumours,' Syd. Soc., p. 49; 'Gny's Hosp. Rep.,' vol. ii.

			pints; then serous fluid and blood	cavity lined with false membrane and filled with grumous blood derived from the mouth of an hepatic vein		
98	M. 40	Tense, circumscribed tumour of right hypochondrium. Nine months after, fluctuation, reddening of skin, and spontaneous rupture	More than 300 entire hydatids	The wound remained fistulous for a long time, but the patient was not inconvenienced by it. It was healed six years afterwards.	Cure	Guattani, 'De Ext. Aneur.,' p. 109, Romæ, 1772; Cruveilhier, "Dic. de Méd. et de Chir. prat.,' t. i, Art. "Aceph.," p. 223.
99	F. 53	Hydatid tumour of the liver for 30 years. Spontaneous rupture near the umbilicus 29 years before death	"A particular liquid which occasionally presented a purulent character"	At the time of rupture a great number of hydatids were discharged through the opening, and this recurred from time to time. Two tumours were found near the umbilicus which communicated with a passage full of a chalky matter, continuous with the upper part of the liver	The evacuation of the contents of the tumour failed to arrest the growth of the parasite; but it appears that the tumour in the liver underwent calcareous degeneration and contraction	Thompson; 'Gaz. Méd. Paris,' 1844; Cadet de Gassicourt, Thèse de Paris, 1856, No. 50; Davaine, obs. v, p. 384.
100	—	Hydatid tumour of liver, rupture through abdominal parietes	—	Infiltration of hydatid fluid under the skin and abdominal muscles, causing sloughing and—	Death	G. Budd, M.D., and Sir W. Fergusson; Budd on 'Dis. Liver,' 3rd edition, p. 437.

PATHOLOGICAL AND SURGICAL OBSERVATIONS ON THE DISEASES OF THE EAR.

(EIGHTH SERIES.)

ON

DISCONNECTION OF THE INCUS AND THE STAPES;

ITS EFFECTS UPON THE FUNCTION OF HEARING, AND ITS TREATMENT.

BY THE LATE

JOSEPH TOYNBEE, F.R.S., F.R.C.S.,

CONSULTING AURAL SURGEON TO ST. MARY'S HOSPITAL, TO THE ASYLUM FOR THE DEAF AND DUMB, TO THE ASYLUM FOR IDIOTS, ETC.

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Anatomical and Physiological Observations.

THERE appears now to be but little doubt in the minds of those who have studied the physiology of the ear, that the chain of ossicles in the human ear has two distinct functions—*one* to conduct sonorous vibrations from the *membrana tympani* to the labyrinth, the *second* to adapt the labyrinth for the reception of sounds of different degrees of intensity.

That the chain of bones conducts vibrations from the

membrana tympani to the labyrinth, and that the progress of these vibrations is not materially interrupted by the different planes presented by the several portions of the chain, nor by the presence of the articulations, is rendered evident by some experiments of my own, the results of which were laid before the Royal Society in the year 1859; and, above all, by the highly interesting observations of MM. Lissajons and Dessains who have been able to picture undulations upon paper produced by a hair attached to the base of the stapes, and which hair was caused to vibrate by the motions of the drum under the influence of sounds.

But it may be asked, if the main channel for the passage of sonorous vibrations to the labyrinth be the chain of ossicles, how does it happen that cases occur in which this chain is found interrupted after death by the disarticulation of the incus and stapes, and in which, nevertheless, the patient during life was not known to be deaf? The reply is, that a simple disconnection of the incus from the stapes is of comparatively slight importance, so long, at least, as the *tensor tympani* ligament, the *membrana tympani*, and the mucous membrane of the tympanum, are healthy, inasmuch as the stapes and incus are then kept in tolerably close apposition. Thus, if the tympanic cavity be exposed in dissection, and the incus simply disarticulated from the stapes, the two bones will be observed to be in contact, and to remain so even when the whole of the chain is moved by traction upon the *tensor tympani* muscle or by the depression of the stapes.

Indeed if a thin slip of paper or of india-rubber be inserted between the disconnected incus and stapes, the force by which the incus is pressed against the stapes is sufficient to squeeze the foreign body between the two bones and to retain it there. And this force is mainly due to the action of the *tensor tympani* ligament, a structure of great importance in the function of hearing. This ligament is tubular, and encloses the tendon of the *tensor tympani* muscle. It is about three fourths of a line in length, and is attached internally to the cochleariform process, and externally to

that part of the inner surface of the malleus where the long process joins the neck. Its office is to keep the *membrana tympani* and the chain of bones in a state of gentle tension, and, when cut through in dissection or destroyed by ulceration, the *membrana tympani* and chain of bones become flaccid and relaxed.

But it may be asked further, if the chain of bones is the medium for the passage of vibrations to the labyrinth, how it is that when, with a large orifice in the drum, the incus is seen to have lost a considerable portion of its long process, so that its connection with the stapes is not possible, still the hearing power is not very materially affected? The explanation of this phenomenon will be found in a paper giving some researches upon the function of the chain of ossicles in the human ear above referred to. From the experiments detailed in that paper it would appear that the stapes, when detached from the incus, can itself receive sonorous vibrations from the air and conduct them to the labyrinth in sufficient force to ensure tolerable hearing.

That a *second* function of the chain of bones is to adapt the labyrinth for the reception of sounds having various degrees of amplitude, appears also to be proven by experiment and dissection. Thus, when the ear is expecting to receive a loud sound the *membrana tympani* is drawn tense by the *tensor tympani* muscle, and the incus and stapes being pressed inwards, the fluid in the labyrinth is also pressed upon, and the membrane of the *fenestra rotunda* is tightened; on the contrary, during the act of listening the *membrana tympani* is relaxed by means of the stapedius muscle, the office of which is to draw outwards the stapes, the incus, and malleus. Thus, the *tensor tympani* muscle has the function of tightening the *membrana tympani* and the *membrana fenestræ rotundæ*, while the stapedius muscle has the function of relaxing them. But when the long process of the incus has been removed, of course the *tensor tympani* muscle can no longer exercise any influence upon the stapes, and it would seem that in this case the return of the stapes to its state of quiescence, after the action of the stapedius

muscle has ceased, is due to the ligaments which surround the base of the stapes and connect it with the circumference of the *fenestra ovalis*. The adapting faculty of the ear, so essential to the hearing of the human voice in conversation, is then effected tolerably well by the action of the stapedius muscle and the reaction of the ligaments of the base of the stapes. This action and reaction may be demonstrated in dissection by exposing the base of the stapes in the vestibule and then gently pressing upon its anterior extremity; the stapes will be observed to yield slightly under the pressure, and to return to its position so soon as the pressure ceases. If, in another specimen, the incus be removed, and the stapes be drawn backwards in the direction of the pyramid containing its muscle, the stapes will be observed to return to its original position as soon as the traction ceases.[1]

From the foregoing observations it may be fairly assumed—

1. That the function of the chain of bones is twofold, viz., the transmission of sonorous waves to the vestibule, and the regulation of their force.

2. That when the continuity of this chain is interrupted by the disconnection of the stapes and the incus, the functions of the chain may, nevertheless, be performed by the combined actions of the *tensor tympani* ligament and muscle, and of the *membrana tympani* itself.

3. That after the destruction of the *membrana tympani* and the loss of the incus, the stapes can still receive vibrations from the air and conduct them to the labyrinth, in sufficient force to allow the patient to hear ordinary conversation with tolerable ease.

4. That after the *membrana tympani* has been destroyed and the incus removed, the combined action of the stapedius muscle and the ligaments connecting the base of the stapes to the *fenestra ovalis* may be adequate to perform the adapting function of the ear, so that the patient may hear ordinary conversation with tolerable ease.

[1] In a paper published in the 'Medico-Chirurgical Review' I have shown that the movement of the stapes in the fenestra ovalis is like to that of a piston in a cylinder.

Pathological and Surgical Observations.

It may appear somewhat remarkable that the lesions of the drum and the chain of bones adverted to in the foregoing remarks are, as a rule, productive of so slight a diminution in the function of hearing that medical men are not commonly applied to for their reparation. These lesions are noticed when the patient applies for other reasons than for the relief of deafness, viz., for discharge from the tympanum, pains, &c. If, however, certain other lesions are superadded to those above named, then most serious deafness ensues. These lesions and the remedial measures adapted for their relief will now be pointed out.

The lesions may be divided into two distinct classes, the *first* being those in which the *membrana tympani* is entire, the *second* those in which the *membrana tympani* is more or less imperfect.

(*a*) *Of those cases in which the stapes and incus are disconnected, the membrana tympani remaining entire.*

It has been stated above that simple disarticulation of the incus and stapes is not productive of any material diminution in the hearing power, inasmuch as if the *membrana tympani*, the *tensor tympani* ligament, and the muscles, are healthy, the two bones are kept in contact and are enabled to move in concert. But if the *membrana tympani*, or the *tensor tympani* ligament, or the muscles of the chain of bones, or the mucous membrane of the tympanum, are affected, then the incus and stapes can no longer be retained in contact, or at least not without *constant* muscular effort.

The first division of this class of cases to which I shall refer is that in which *the hearing power is imperfect unless the act of listening is practised or the drum is supported.*

Cases have not uncommonly presented themselves to me, where the patients have complained of excessive fatigue and weariness attendant upon the performance of the function of hearing. The patients say "there is no deafness so long as the act of listening is performed, but this unceasing effort of listening entirely destroys the comfort of life."

It is important to understand this kind of defective hearing, because young persons, especially those at school, are liable to suffer from it, and to be treated somewhat cruelly. "It is not deafness, it is only inattention," says the parent or the teacher; "the child hears well enough when it chooses to listen." But no child can be always listening; the healthy ear hears without listening, and if any one will make the experiment and listen attentively, even for a minute or two, to some delicate sound, that is not heard without attentive listening, it will be found that the effort to ear and brain is not a slight one, but is very fatiguing. It has been said already that in the healthy ear this act of listening consists in an action of the stapedius muscle, which draws outwards the stapes, and in consequence the incus, malleus, and *membrana tympani;* the act of listening in the cases under consideration consists in drawing out the stapes, and bringing it into contact with the incus, so as to make the chain of ossicles complete, and also in pressing outwards the incus, malleus, and *membrana tympani,* for it is interesting to observe that the action of listening is the same as that which brings the stapes into contact with the incus, and thus establishes the continuity of the chain of ossicles. It may be asked what evidence there exists that the morbid condition in these cases is disunion of the stapes and incus, inasmuch as it is impossible to see through the *membrana tympani* and thus observe the lesion. The reply is that this lesion is known to be common—this is shown by dissection; that the mucous membrane of the tympanum is known to be subject to affections likely to produce this lesion; that there is usually a history of some such affection; that the condition of the membrana indicates the existence of relaxation; and that the methods of relief cannot be explained upon any other theory than that of the existence of this lesion, or, what is tantamount to it, relaxation of the ligaments of the joint; further still, it may be fairly presumed that this lesion does exist, because *it is seen to exist* in cases where the *membrana tympani* is perforated, and where treatment analogous to that pursued for the relief of the cases now under consideration is perfectly successful.

The *treatment* in this class of cases consists in making gentle pressure upon the outer surface of the *membrana tympani*, so as to keep the incus in contact with the stapes. By means of this gentle pressure the hearing power is perfectly restored. It may be observed that any means whereby the incus is brought into contact with the stapes is equally successful as gentle pressure on the outer surface of the drum; for example, in the following case the sudden drawing inwards of the drum, by what the patient called "a forcible sniff," succeeded in temporarily curing the difficulty of hearing; this "sniff," in reality, produces an exhaustion of some of the air from the tympanic cavity, and a consequent inward movement of the drum and chain of bones, but this condition soon ceases.

Case 1. *Deafness except during the act of listening; cured by the use of the artificial membrana tympani.*—Master I—, æt. 18; three years before he consulted me he suffered from pain in the right ear, which was followed by discharge; this has recurred several times. He complains also of hollow and whistling sounds in the head, which are sometimes accompanied by giddiness and last a minute or two; he also complains of headache, at times with pain at the top of the head; these symptoms sometimes much increase. The hearing power with the right ear, as tested by my watch, was perfect, and with the left ear my watch was heard at a distance of two inches in place of two feet. As a general rule, a patient hearing my watch normally with one ear is not inconvenienced by defective hearing in society, nor was this youth so long as he listened attentively, for by attentive listening he could hear rapid conversation, even when carried on in a low voice; but let his attention be occupied in a room where conversation is going forward, and he hears nothing, in fact, he sits like one deprived of the faculty of hearing until his attention is attracted and he is induced to listen, when he hears perfectly. Some time since, he discovered accidentally that by "sniffing up forcibly" he could produce a feeling of tightening in the ears, which was followed directly by an

improved power of hearing, so that without any effort of listening he heard conversation distinctly and easily, and this improvement in the hearing was accompanied by a cessation of the unpleasant sensations in the head.

On some occasions a single "sniff" was sufficient, at others four or five rapidly repeated sniffs were required to produce the good result. It may be added that this patient complained of a discharge from the ear into the throat, which had at times a very unpleasant odour. Upon inspection the *membrana tympani* in each ear had a sodden appearance, and the triangular bright spot was much larger than natural. Each Eustachian tube was pervious. My diagnosis in this case was that there had been catarrhal inflammation of the tympanic mucous membrane, which had more or less disconnected the incus and stapes; that by a considerable effort of volition the *tympanic* muscles were able to bring the two bones into perfect contact in the right ear, and into imperfect contact in the left. It also appeared probable that the peculiar head symptoms were the result of the relaxed condition of the stapedial ligaments, which were not sufficiently firm to retain the base of the stapes firmly in the *fenestra ovalis*. Acting on this belief, I applied to the left ear, in the first place, an artificial *membrana tympani*, so as to give very gentle support to the malleus, and by pressing it slightly inwards to place the incus in contact with the stapes. The result was most satisfactory; the patient at once found himself hearing better and without any effort, and so long as the artificial drum remained in the ear he heard without the slightest difficulty, even the lowest sounds. The head symptoms also disappeared with the presence of the drum, and reappeared when it was withdrawn. Subsequently the artificial drum was applied to the right ear with similar effect.

It may be added that the ordinary artificial drum was not successful, but the globular form, to be noticed hereafter, acted perfectly.

In the previous case the hearing power became defective,

that is to say, the patient was obliged to listen attentively, directly the artificial drum was withdrawn. In the following case the benefit remained for a considerable period after the support to the *membrana tympani* had been removed. In other respects the two cases are very similar.

Case 2. *Deafness except during the act of listening; hearing restored by the use of the artificial membrana tympani, the power retained after its withdrawal.*—Master G. S—, æt. 14, consulted me on account of deafness in the *left ear*, which he considered to be nearly useless. The right ear is perfect when the act of listening is performed, but not otherwise. The cause of the deafness is said to be an attack of scarlet fever when quite a child. My watch was heard at a distance of twenty six inches by the right ear, of nine only by the left. A whisper is heard at a distance of eight yards with the left ear as well as with the right, and this with the back turned towards the speaker; but the father of the patient, who was a witness of the experiments, assured me that when his son sits reading and his attention is absorbed he requires to be spoken to in a very loud voice in order to be made to hear. Each *membrana tympani* is dark and has a sodden appearance. Upon the application of an artificial drum to each ear, the patient experienced an immediate "sense of comfort" and ability to hear without the exercise of any effort. Upon his return home it was found that, whatsoever his occupation, he heard as well as those around him. The hearing power remained for several hours quite perfect after the withdrawal of the drums, and by degrees the drums were wholly dispensed with.

The second class of cases consists of those in which the membrana tympani is perfect, but the hearing power is very defective, even during the act of listening, unless the membrana tympani and chain of bones are supported.

In this class of cases there is usually a history of some catarrhal affection of the mucous membrane lining the tympanum; and although it is impossible to speak positively

as to the exact pathological condition of the ear, there is every ground for believing that the incus and stapes are not in apposition, and that the action of the muscles, pertaining to the chain of bones, is insufficient to bring these two bones into contact. Therefore, the only difference between this class of cases and the preceding one is that, whereas in the preceding class a voluntary effort *can* bring the incus and stapes into contact and keep them so, in the present class of cases the two bones *cannot* be brought into contact by voluntary effort. Perhaps the best illustration I can cite of this class of disease is the case of Dr. Erhard, of Berlin, whom I had the opportunity of examining very carefully when I was in Berlin three years since. If I remember rightly, Dr. Erhard had some catarrhal affection of the mucous membrane of the tympanum in early life. This was followed by deafness in one ear, so that it was almost useless for the purposes of conversation, &c. The *membrana tympani* was entire, but of a dark colour, and it had a sodden appearance. When the tympanic cavity was distended by air the *membrana tympani* bulged out, but no air passed through it. Before testing the ear in various ways, the hearing power was found to be very defective; indeed, the ear may be said to have been useless even when every effort to hear was made by the patient. Gentle pressure was then made upon the outer surface of the drum, in this instance by cotton wool steeped in a solution of lead, and then the hearing power was at once and fully restored. Dr. Erhard, in a very interesting paper, showed clearly that the good effect of cotton wool depended upon its action upon the chain of bones.

The third class of cases consists of those in which the incus is not only disarticulated from the stapes, but the long process of the incus has also been more or less absorbed, the membrana tympani remaining entire.

This class of cases fortunately is not common, inasmuch as the amount of disease in the tympanic cavity, which induces absorption of the long process of the incus, is usually sufficient to cause destruction of a larger or smaller portion of the *membrana tympani*. The only means of affording relief

to deafness in these cases is to press the *membrana tympani* inwards, and to keep it in contact with the stapes, when the vibrations are conveyed to the drum and thence to the stapes.

And it is interesting to find that nature herself not infrequently adopts this process of cure, for dissection has shown that the stapes becomes attached to the *membrana tympani*.

(*b*) *Of the disconnection of the stapes and incus, the membrana tympani being perforate.*

Cases are of constant occurrence in which there is evidence of the *membrana tympani* being imperfect, and still no evidence of deafness is apparent. Thus, it is common for smokers to send smoke out of the outer ear, which operation, of course, can only be performed when there is an orifice in the drum, but such smokers are usually quite unconscious of the existence of any defect in hearing; indeed, in their ignorance of the structure of the ear, they believe that every smoker may do the same feat. And if these cases of perforated *membrana tympani* be carefully examined, it will be found that there is but little diminution in the hearing power, the remnant of the drum being sufficient to receive and to conduct vibrations to the chain of bones; and the chain of bones is sufficiently normal to conduct them to the nerve; while the entire apparatus of drum, bones, and muscles, can perform the "adapting" function of the ear. On the contrary, cases are being constantly met with in which there may be merely a small orifice, perhaps one half or one third the size it is in the above-named cases, and in which the hearing power is so defective as to render the organ almost useless. In what does the difference between these two classes of cases reside? Simply in the fact that in the former cases the chain of bones is perfect, while in this latter class of cases the chain of bones is imperfect, being flaccid in place of being in a state of moderate tension. This relaxed and flaccid condition of the chain of bones may depend upon the loss or softening of the *tensor tympani* ligament, or upon a thickening of the tympanic mucous membrane, or upon

relaxation of the ligaments connecting the incus and stapes; but whatsoever the cause may be, the aim of the treatment is the same, viz., to give to the chain of bones its normal resiliency. This is to be effected by applying gentle pressure to the outer surface of the malleus by means of an artificial *membrana tympani,* and it is for these cases that the artificial drum is most frequently used.

There is another class of cases belonging to this division of the subject—*those in which the stapes and incus are not only disarticulated, but in which the incus has disappeared.* I have already mentioned the fact, one well known to students of aural surgery, that the loss of the incus does not necessarily entail deafness. On the contrary, many persons, by aid of the stapes alone, can not only receive vibrations upon the nervous apparatus, but they can adapt the ear, and with great facility, to a variety of sounds. Nevertheless, cases are not infrequently met with where great difficulty of hearing coexists with this condition, and this great difficulty of hearing depends upon the relaxed condition of the ligaments connecting the base of the stapes to the fenestra ovalis; the stapedius muscle having drawn the stapes outwards, the ligaments have no longer the power to draw it back to its previous position. This disease is fortunately not hopelessly incurable, for if gentle pressure be exercised upon the head of the stapes by some very elastic body, such as the artificial drum, then the bone is pressed back to its position, and the function of hearing may be performed without difficulty.

It can well be conceived that, to exercise gentle continuous pressure upon the membrana tympani, the chain of ossicles, or a single ossicle—as the stapes—and still to allow the muscles to move the bones, is a matter of considerable nicety, and the body making the pressure must possess firmness, and still be very resilient. Mr. Yearsley uses cotton wool; I have hitherto used a delicate layer of vulcanized india-rubber; the former becomes sodden with discharge, besides being not easy of application. As an improvement upon the layer of vulcanized india-rubber, I have lately suggested the use of an artificial drum, composed

of a bubble of vulcanized india-rubber containing air; by means of this, firmness and due resiliency are attained.

It may be well to sum up here the several pathological conditions of the ear for which the artificial *membrana tympani* has been found efficient.

1. Disconnection of the stapes and incus, the *membrana tympani* being entire, but the tensor tympani ligament, or the mucous membrane of the tympanum, being relaxed.

2. Partial or complete absence of the long process of the incus, the *membrana tympani* being entire.

3. Disconnection of the stapes and incus, the *membrana tympani* being perforated, and the *tensor tympani* ligament, or the mucous membrane of the tympanum, being relaxed.

4. Partial or complete loss of the long process of the incus, the *membrana tympani* being perforated, and the ligaments of the stapes being relaxed.

The foregoing observations upon the pathological conditions of the chain of ossicles in the human ear are based upon dissections, which have, during many years, been laid before this Society, and of which descriptions have been published in the 'Medico-Chirurgical Transactions.'

A CASE

OF

PREMATURE MENSTRUATION.

BY

THOMAS CLIFFORD ALLBUTT, B.A., M.B. CANTAB.,
PHYSICIAN TO THE LEEDS GENERAL INFIRMARY, THE LEEDS FEVER HOSPITAL, ETC.

Received March 28th.—Read June 12th, 1866.

THE case which follows lately occurred in my practice, and appears to me to be sufficiently remarkable to deserve record. It is a case of premature menstruation, in which the menstrual flow appeared in a little girl on the eighteenth, nineteenth, twentieth, twenty-first, and twenty-second months of her age respectively. The patient, Miss W—, was seen by me in the summer of 1865. She was then suffering from quick weak pulse, loss of appetite, sleeplessness, periodic sweats, wasting, and other symptoms of hectic fever.

Mrs. W— told me that her child was then one year and six months old, and that she attributed the above symptoms to exhaustion consequent upon an appearance of the menses which had taken place upon the previous Saturday evening, and lasted till the noon of Monday. My visit was on the Wednesday. The mother, though surprised by the appearance, did not seem to be fully aware of the real strangeness of the circumstance. I naturally received the account with perfect incredulity, and examined the genital organs for

the origin of a local discharge. I found the parts, however, quite normal, well formed, natural in size, and having no appearance of premature puberty. I also examined the parts about the anus, which I found quite healthy. I then took upon myself to assure the mother that she was wholly mistaken in her supposition—that discharges of the kind she had seen were not very uncommon in young children—that it had apparently quite disappeared, and probably would not return. I also carefully examined the child all over, but could find no tenderness anywhere on pressure, or evidence of disease in any organ. As the child was then mending a little, according to the nurse's account, I ordered some simple remedies, and gave a favorable opinion. In three or four days the child was well enough to allow of my taking my leave.

On the Saturday evening month after the reported appearance I was called to a serious case of illness in a distant part of Yorkshire, and was unable to reach home until the Monday morning. On my arrival I found a message reporting a return of the discharge in M. A. W—, and begging me to call. Engagements beyond my control prevented my seeing the child until the evening, when I found that the discharge had ceased some hours. On a most careful investigation I could not discover anything more than some congestion about the pudenda. Certainly there was no ulceration within reach, and at that time no discharge of any kind. Some napkins having the appearance of menstrual cloths were shown me. The child was again in a dangerous state of hectic. I could not help showing to the friends that I felt still great doubts upon the matter, so much so that the mother, her sister, and the nurse, got a little out of temper with my scepticism, and the nurse observed, "Well, doctor, if three women do not know better than one man, when a girl is at her poorly time, we had better hold our tongues."

I attended the child for about ten days. The hectic state, if, for brevity, I may use a comprehensive term, was more severe than before, but slowly passed off, leaving the child

wasted and feeble. In about three weeks, however, she regained some flesh, and was beginning to put on her natural appearance of a well-grown, rather delicate-looking child of nineteen months old. I waited with some interest for the next period, and was accordingly again sent for with curious exactness on the Saturday evening month, when the napkins were removed, and I could no longer doubt the fact that this baby was actually menstruating. The quantity was much less than that of a girl at puberty, but nevertheless it was now clear that a sanguineous discharge issued at monthly periods from the otherwise quite healthy genital organs of this young child, which discharge lasted for two or three days, and then wholly disappeared until the following period. The child now fell again into a state of hectic more severe than the former states, and leaving still more feebleness and emaciation.

I witnessed two more monthly periods occurring at the due times, followed in each case, as before, by a cessation in about two and a half days, the periods being succeeded by states of hectic of progressive severity. After the fifth appearance the consecutive disorder was so great that the little child died wasted and exhausted.

I much regret that the parents were unwilling, from a false sense of shame, to allow me to call in any other physician or medical man, and that they absolutely refused a post-mortem examination. They even forbade my removing the ovaries.

Such are the particulars of this curious case, which, at the time, I supposed to be almost unique. On reference, however, to the literature of the subject, I find that Mad. Boivin quotes from Sir C. Clarke a case of menstruation in a child of nine months old, in which case the periods recurred until the age of nine years, the age at the time of observation. After hunting for this case in vain, I found it at last recorded by Dr. Martin Wall in the 'Transactions' of this Society, Vol. II, p. 116. Sir C. Clarke, indeed, mentions a case of menstruation at the age of nine years, and such cases are not uncommon. In Dr. Wall's case the child

("muliercula potius quam puella," as he calls her) seems to have borne the function well, and at the age of two years presented all the signs of puberty. No such signs appeared about the vulva or mammæ in my case. I find mention several times of cases of menstruation above the age of four years. But in the 'Lancet' of 1848, p. 137, Mr. Embling, of Brompton Row, writes, "I had a little patient, aged three years, who was reported to be poorly. I found, on inquiry, that the child had menstruated for one year. The mammæ were healthily developed, as in an adult at twenty. The nates were also large, and the pubes had a slight flush of hair upon them. The labia were as in a matured young woman. The hymen was perfect, and the vagina large anteriorly. The countenance was antique, and altogether this babe of three years had the appearance and gait of a little old woman. I observed the child for a few months."

I also find the following case quoted from Meckel's 'Archiv f. Anat. u. Physiol.,' 3e cah., in the 'Lancet' of November, 1828. In this case the child menstruated at the age of nine months. It was born like other children in size, &c., but soon began to grow rapidly, and at the ninth month was of the size of a child aged a year and a half. At this time appeared a sanguineous emission from the vagina, and again more abundantly at the eleventh month, when the breasts began to enlarge and the pubes to become hairy. The courses again appeared at the fourteenth month and at the nineteenth. At this time the child was well formed, three feet nine inches high, and twenty-two inches round the thorax. The breasts and external genitals were fully developed. The child had shown no sexual desire, nor did it exceed other children in intelligence.

These three cases are curiously like one another. It does not appear, however, that premature menstruation necessarily coexists with obvious bodily development, as in many such cases I find that it caused emaciation. In one case (the reference to which I have unfortunately misplaced) it caused hectic and death, as in my own.

CASE

OF

MYELOID TRANSFORMATION OF THE LUNGS.

BY

THOMAS CLIFFORD ALLBUTT, B.A., M.B. Cantab.,

PHYSICIAN TO THE LEEDS GENERAL INFIRMARY, THE LEEDS FEVER HOSPITAL, ETC.

Received March 28th.—Read June 12th, 1866.

The case which I wish now to record is, I believe, unique in the history of pathology. It is a case of myeloid transformation of the lung. Certainly no case is recorded as such, and I have searched in vain among earlier records to find a history of anomalous lung affection, the description of which might approach my own. The case occurred under my care, in the Leeds Infirmary.

A lad, aged 14 years, came into that hospital under the surgical care of my friend Mr. Wheelhouse, for some trifling accident. During his stay Mr. Jessop, the house-surgeon, hearing some complaint from him, examined his chest, and found the left side, as it was supposed, full of fluid. Mr. Wheelhouse asked me to see the boy. As this occurred many months ago I do not remember my own diagnosis, but I do remember that I did not propose paracentesis thoracis, and that I told the students my conclusion was, from the state

of lung, the rapidity of the pulse, and wasting, that the boy would die. My impression is that I believed the case to be one of tuberculous pneumonia. Last autumn the same boy came under my care at the hospital. Believing Mr. Wheelhouse's patient to be long dead, or rather the case having passed from my mind altogether, I did not recognise the boy. On examination I found complete dulness and stillness all over the left chest, and the heart beating under the right nipple. The pulse was 125, or thereabouts, and weak; and the boy was suffering from wasting and marked hectic, with chills, sweats, and remissions. Owing to the feebleness of the voice, no certain conclusions were obtained concerning the vocal fremitus and vocal resonance. There was little or no cough, and no very great dyspnœa. There were two arguments against the contents of the pleura being fluid—namely, that the intercostal spaces were not bulged, and that the measurement of the left chest only exceeded that of the right by three quarters of an inch. On the whole, however, I presumed, from the position of the heart, &c., that the contents were fluid, and supposed that the inflammation, not attacking the costal pleura, had not paralysed the intercostal muscles. There was no special reason to suspect malignant disease, as the boy was not extremely wasted, nor did he present a marked cachectic aspect. The duration of the disease could not be learnt with any certainty, but seemed to have been very long. Under these circumstances I requested Mr. Wheelhouse to explore the chest with a fine trocar, which he did in two places, but failed to find fluid. The case now became exceedingly interesting, and I fear that our interest became too evident, for the boy, gathering from the manner of the students some suspicion of his approaching death and examination, insisted, to my great regret, on leaving the house. Fortunately, he lived within a few miles of Leeds, and I informed myself of his death some weeks later, and with some difficulty obtained leave for a post-mortem.

Mr. Jessop kindly accompanied me, and made the examination. We then discovered a most extraordinary state of

things. On raising the sternum we found all the front of the chest occupied by a greenish-white mass. This mass extended three or four inches across the middle line to the right, thrusting the heart into the right chest, and filling entirely the left half of the thoracic cavity. Vertically, it extended up to the clavicle, and, thrusting down the diaphragm, extended below as far as the left kidney. The right border presented the outline of the margin of a lung, was thinned off from the under side, and showed a trace of the lobar division. On attempting to thrust a knife into the apparently malignant mass, we found to our astonishment that it offered a great, I may say almost insuperable, resistance. We therefore dug into it as well as we could, and found it to consist of a dense fibrous substance, very plentifully filled with little bony plates and masses, some resembling terminal phalanges, others like sequestra. These varied in size from a pin's head to an inch or two in length, and were of true bony structure. On now passing the hand under the ribs we found our way into a large quantity of paltaceous and sanguineous material, breaking down at once into pulp on the least pressure, and also containing myriads of the bony morsels.

We supposed this to be the true and original myeloid growth, and that from it the overlying lung had become impregnated and charged. But we performed our autopsy under most unfavorable circumstances, in a dark awkward corner of a poor dwelling, and the true connection of the parts could with difficulty be ascertained. We were quite unable to find any attachment about the ribs or spine which could have pointed to the first seat of the evil.

We were watched by the friends so closely that we deemed it inexpedient to carry away any of the parts. Mr. Jessop, nevertheless, was able to pocket surreptitiously pieces of the hard and of the soft tumours as specimens.

We learned from the friends that the boy had suffered from dyspnœa from early childhood, and had, indeed, never been able to join in the sports of his companions. We enclosed portions of the tumour to Dr. Wilks, from whom

we received a letter which fully bore out our own diagnosis, and that so completely that I have obtained his consent to quote it at length. He says—

"I was so occupied when your specimen came that I handed it over to my successor in the pathological department of Guy's, Dr. Moxon, to examine for me. I told him it looked as if it had grown from bone, as from the jaw, and might be a large epulis.

"I told him it resembled the fibro-plastic tnmours of Lebert, but which were really fibro-myeloid. I drew a large myeloid cell, explaining what I thought the tumour would contain. Dr. Moxon informed me, on Saturday, that he had found exactly what I conjectured, and had some drawings of the cells.

"I will request him to communicate with you.

"The case appears a very remarkable and interesting one.

"I have seen almost every kind of growth spring up in the chest, mostly arising about the root of the lung; but never myeloid.

"Myeloid is described as occurring in soft parts, but I have never seen a case unconnected with bone."

According to the request of Dr. Wilks, Dr. Moxon forwarded to us the interesting and valuable communication which I also subjoin:

"It is now long since I received from Dr. Wilks a small specimen for examination. This consisted of a hard substance and a soft, separate from each other. I examined both carefully the day after I got them, and have repeated the examination this morning. I do not think there is anything to be added to your own description of them. The harder is composed of remarkably tough fibrous tissue, imbedding denticulate portions of loose bone, perfect in its structure, and also growing into the fibre-tissue. Two peculiarities in the fibre-tissue seemed worthy of notice:—1st, it contained thick ramifying bundles, which ran from bone to bone, distributed like vessels, and each, on section, seen to enclose a blood-vessel of greater or less size, surrounded by concentrically arranged elements, reminding one forcibly of

the structure of bone; 2ndly, the tissue at many points had localized portions of growing elements thickly packed, and having appearances quite accordant with malignancy in the tumour—*i. e.* strongly marked outline and bright nucleoli.

"The softer red substance was a perfect example of myeloid. The characteristic cells or capsules were seen before the addition of acetic acid to have very soft succulent-looking stroma between them, imperfectly fibrillated; this cleared up with acetic acid. Much of the myeloid showed granular degeneration of the cells.

"It has never chanced to me to fall on such a case, which is a most highly interesting one. We have in the museum of Guy's an example of myeloid disease of the lung in distinct masses; we have also bony tumour of the lung. I do not see anything like it in the 'Pathological Transactions.'"

ON

ATROPHY OR DEGENERATION

OF THE

MUSCLES OF THE UPPER AND LOWER EXTREMITIES,

FROM DISEASE OF THE SPINAL CORD.

BY

GEORGE LEWIS COOPER, F.R.C.S.,
SURGEON TO THE BLOOMSBURY DISPENSARY.

Received April 13th.—Read June 12th, 1866.

The unsettled state of our knowledge with regard to the exact nature and causes of muscular atrophy, and the imperfect manner in which, until recently, the nervous centres have been examined after death, are my reasons for bringing before the Medical and Chirurgical Society my notes of the following case. At the same time I must acknowledge my grateful thanks to Mr. Lockhart Clarke for his kind assistance in the pathological investigation of the diseased structures.

John J—, æt. 41, married, but without any family, was much exposed, in his occupation as coachman, to changes of weather, and was also addicted to habits of intemperance. He had suffered for many years from severe cough, with profuse expectoration of a muco-purulent character, which was increased in winter or after taking ardent spirits. He

was admitted under my care as a patient at the Bloomsbury Dispensary, on February 14th of the present year, just a fortnight before his death. On my first visit he was suffering from total loss of power of the upper and lower extremities, with atrophy of the muscles of these regions. When the arms and legs were raised they would drop if not in some way supported. His countenance was dejected and expressive of great debility, and he complained of a feeling of suffocation or constriction about the throat. The pulse was 60, weak, and labouring; his appetite was bad; he was unable to lie down in bed, and had had but little or no sleep for several nights; the tongue was dry, with sordes about the mouth; the bowels were regular, and the urine was plentiful, but abounding in lithic acid. He died on the 26th of February.

About three years ago he complained to his wife of a weakness in the thumb of his right hand, with frequent twitchings of the muscles, which increased after a few months to such an extent as to disable him from holding his whip to his satisfaction. The muscles of the thumb soon after wasted and became incapable of action. The extensors also of the forearm speedily wasted and became weak and inactive; the flexors, however, remained unaffected for some time after, but eventually followed the course of the extensors and fell into the same powerless condition, ending in complete motor paralysis. The biceps and deltoid now became flabby and weak and were gradually absorbed, especially the deltoid, depriving the shoulder of its roundness, and showing an evident projection of the acromion, with complete loss of power of the elevators of the shoulder.

About a year ago the *left* hand and arm followed precisely the same course as the right, with the exception that it was more rapid, and, perhaps, showed a greater degree of atrophy or wasting, accompanied by a complete loss of power. About six months ago the lower extremities assumed the same condition, commencing at the toes and subsequently extending to the ankles, legs, and thighs, with progressive wasting of the muscles.

Throughout the progress of the disease the bowels and kidneys exercised their due functions with perfect regularity, nor were the muscles of the thorax or abdomen in any way implicated.

Forty-eight hours after death I obtained permission, with the greatest difficulty, to make a post-mortem examination. On opening the vertebral canal, with the assistance of Mr. Ferris (resident Medical Officer of the Bloomsbury Dispensary), I found the membranes of the cord distended with fluid. The cord itself was carefully removed and sent to Mr. Lockhart Clarke.

EXAMINATION OF THE SPINAL CORD.

By Mr. Lockhart Clarke.

In the upper part of the cervical enlargement the pia mater of the cord was much congested, and beneath it a variable quantity of granular exudation was found on the surface and in the substance of the white columns, which were softened more or less in different places. In the posterior columns these morbid changes were limited chiefly to the superficial layers; but on the anterior side of the cord they extended through the whole depth of the columns, and even into the central and lateral parts of the grey matter, which in certain places was almost diffluent and broken into separate masses, or mixed up with the white substance in the form of streaks. All these appearances may be observed in some of the accompanying preparations. The lateral columns retained their normal consistence, but in many sections the pia mater was unusually vascular.

The middle and lower parts of the cervical enlargement were much less damaged, although the posterior and anterior white columns, especially the latter, with the grey substance adjoining, were not only congested, but softened to a considerable degree.

The two upper thirds of the dorsal region were apparently healthy; but at the commencement of the lower third, for

about an inch downwards, the central grey substance on each side of the canal contained an enormously dilated blood-vessel, surrounded for some distance by free or extravasated blood-globules. In some sections these enormous vessels were seen to extend through the posterior median fissure as far as the surface where they entered the cord. These remarkable appearances are represented in figs. 1, 2, 3, and 4, which are plain but exact outlines of different sections of the grey substance. The extremities of the posterior cornua were in many places very vascular, and in other parts of the grey substance there were streaks or patches of extravasated blood. The pia mater at the surface of the cord was exceedingly congested, and the superficial layers of both the posterior and anterior columns, but especially of the latter, were more or less softened and infiltrated with granular exudation.

Along the rest of the dorsal region the cord was affected by local congestions, by exudations, and by granular disintegration; while still lower down, the lumbar enlargement and cornus medullaris retained their normal consistence and presented their natural appearance.

DESCRIPTION OF PLATE III.

Figs. 1 to 4.

a. Anterior cornu of grey substance.

b. Posterior cornu.

cc. Enormously dilated blood-vessels, one of them, in fig. 2, extending along the posterior median fissure *c'*.

Fig 1

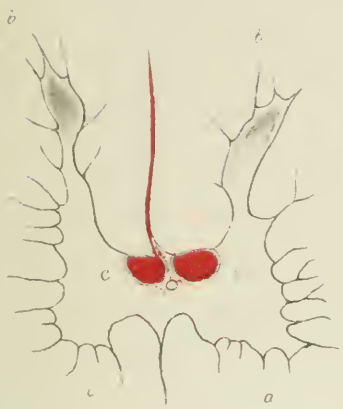

Fig 2.

Fig. 3.

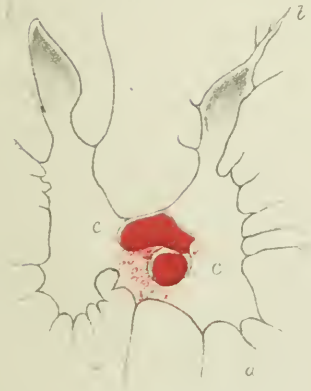

Fig. 4

ON A CASE

OF

ELEPHANTIASIS ARABUM, OR ELEPHAS,

SUCCESSFULLY TREATED BY THE

APPLICATION OF A LIGATURE TO THE MAIN ARTERY OF THE LIMB;

WITH REMARKS.

BY

THOMAS BRYANT, F.R.C.S. Eng.;

ASSISTANT-SURGEON TO GUY'S HOSPITAL.

Received May 8th.—Read June 26th, 1866.

Elephantiasis Arabum, Barbadoes leg, Cochin leg, or, more properly, Elephas, although generally regarded as a tropical disease, is not infrequently met with amongst the inhabitants of this island; it is to be looked upon as a local affection, as depending on certain local changes, being quite distinct from the severe constitutional disease—the true leprosy—which has been described as an Elephantiasis Græcorum.

It is in the majority of instances confined to one part of the body, or to a single limb, but at times it may simultaneously involve two or more; it has hitherto completely baffled all ordinary medical or surgical skill, and the only

effective treatment has been amputation or excision of the diseased growth. Could any means, consequently, be hit upon by which this hitherto intractable affection might be brought within the category of curable affections, without involving the sacrifice of a limb, it would be hailed with satisfaction, and as a contribution to such an end the following case has been brought before the notice of this Society. It is the first, I believe, which has been so treated in this island, and the success of the result is, without doubt, encouraging.

(Reported from the notes of Messrs. C. Sangster, George Rootes, and Benjamin Duke.)

Mary T—, æt. 25, the daughter of Welsh parents, and a native of Carmarthen, was admitted into Petersham Ward, Guy's Hospital, on October 10th, 1865, under the care of Mr. Thomas Bryant, the case having been sent to him by Mr. Rowland, surgeon, of Carmarthen. She was a single woman, of a healthy aspect, and had always enjoyed good health, never having had any illness of much importance. Ten years previously she had scarlet fever of a mild type, unaccompanied by any of its ordinary complications, and it was during her convalescence from this disease that the left leg began to swell, the swelling beginning in the calf and extending upwards towards the knee; it was unattended by pain or any indication of general disease.

For two years the enlargement gradually increased, when she slept in a damp bed, after which the disease progressed more rapidly and extended upwards, involving the thigh; the increase was still, however, perfectly painless. Four years afterwards she was admitted into the Carmarthen Infirmary, and was under treatment for three months—hot baths, rest, and pressure by bandaging being employed; this treatment failed, however, to make the slightest impression on the disease, the limb steadily going on increasing.

Eighteen months after this she applied to the Swansea Hospital, where the limb was bandaged, and for some days cold was locally applied; other treatment was also tried, but

all without effect. Three years since, some small ulcers appeared between a deep sulcus in the enlarged calf, and from one of these, the girl states, a quantity of black fluid, like blood, escaped; the wound subsequently healed, but during last summer it reopened, again discharging a like fluid; the cicatrix still exists.

On admission the left leg was found to be enormously enlarged from the ankle to the groin; to the hand it felt hard and brawny, the skin and cellular tissue being evidently infiltrated with a fibrinous material. At the posterior part of the calf of the leg, and behind the knee, there were several sulci, and in one of the lowest and deepest there was distinct evidence of an old sore, this spot being the one from which the patient states the black fluid had formerly escaped. The skin appeared to be generally coarse, but it was free from the cuticular induration and ulceration which is so frequently associated with this affection. It is to be noted that the foot was perfectly sound.

The measurements on admission were as follows:

Round the left or diseased calf, 24 inches; round the right, 15½ inches; round the diseased thigh, 28 inches; round the right, 21 inches.

The temperature of both limbs appeared to be alike; the pulsation in the left iliac artery was clearly to be felt, but the femoral and tibial vessels of the affected limb could not be made out. The patient was ordered to be kept in bed, and the leg to be well raised on an inclined plane.

On October 13th, or second day, the limb had diminished one inch. On the 16th of October, or fifth day, it had lost another half inch—the calf measuring 22½ inches, and the thigh 27 inches. On October 18th, or seventh day, no further decrease had taken place.

The same treatment was, however, persevered with for another fortnight without intermission, but without benefit, the limb having measured at the end of that time, on October 31st, as follows:

Calf of affected leg, 22½ inches; of sound leg, 14 inches;

thigh of affected limb, 27 inches; of sound limb, 20 inches. (See Plate IV.)

On October 31st, the patient being under the influence of chloroform, Mr. Bryant applied a ligature to the external iliac artery, the vessel appearing to be perfectly healthy and of natural size. The whole limb was subsequently swathed in cotton wool and raised as before.

November 1st, 10 a.m.—She has vomited several times during the night, and slept but one hour; complains of some pain in the wound; the limb is quite warm, and evidently much softer. Mr. Bryant, at 2 o'clock, took the following measurements:

Calf of leg, $21\frac{1}{2}$ inches instead of $22\frac{1}{2}$ inches; thigh of leg, $25\frac{1}{2}$ inches instead of 27 inches.

3.30 p.m.—Vomited once only since the morning; complains of the right or sound limb being colder than the left; to the hand the right foot feels cold; pulse 116. Hot-water bottle ordered to right foot; brandy ℥ij, with ice to check sickness.

2nd, 10 a.m.—Passed a good night, being free from pain; pulse 120, of good power; tongue clean; no return of vomiting; left leg quite warm and free from pain, right comfortable.

3.30 p.m.—Sutures were removed from the wound, when some pus escaped; has taken some meat for dinner.

3rd, 10 a.m.—Has had a restless night and has a slight headache; wound has discharged freely; there is a slight blush around its edges and some tenderness; the limb is perfectly warm.

3.30—Mr. Bryant to-day made gentle pressure around the wound, and some pus escaped; hot fomentations were ordered to be applied.

4th, 11 a.m.—Did not get any sleep last night till 2 a.m., and then only for one hour; the wound has discharged freely and is less painful; the inflammatory blush is subsiding; pulse 70; tongue clean; bowels have not been open since the operation.

Ordered Pulv. Rhei Salin. gr. x horâ somni.

5th.—Much better to-day, having passed a good night.

6th.—Passed a good night. Is free from all pain. Limb is quite comfortable, and is still wrapped up in cotton wool; it has not been opened for several days.

8th, 3 p.m.—The limb was unwrapped to-day, the eighth after the operation, and found to be perfectly warm and comfortable; it was evidently much smaller and softer, the latter fact being very marked. The calf measures 19½ inches, and the thigh 24 inches, or 3 inches less since the operation. The limb was then wrapped up in flannel. The wound looked very healthy.

12th.—Is going on well in all respects. Wound healing, limb becoming softer daily. The calf of the leg is quite baggy.

15th.—The ligature came away to-day without the slightest stain of blood, it being the fifteenth day after the operation. The calf of leg measured 18¾ inches, and thigh 23 inches, having again diminished about 1 inch in the last or second week.

12 p.m.—There was a slight oozing of blood from the wound, which continued till 6 a.m. on the 16th, when it ceased.

17th.—Wound looks healthy, leg warm and softer.

18th.—The limb was measured to-day, the calf measuring 18 inches, and thigh 23 inches.

24th.—The wound has nearly healed, and the limb is quite soft. The girl complains of her foot feeling somewhat cold. Cotton wool was therefore applied. Quinine mixture ordered, with wine ℥vj.

28th.—The calf measured 17½ inches.

30th.—The wound has perfectly healed; in all respects the girl's health is good.

December 6th.—Everything is going on well. The calf was measured, and found to be only 17 inches (being 7 inches less than it was the day before—the iliac artery was ligatured five weeks since).

13th.—The calf measured to-day 16½ inches. All brawniness of the thigh has disappeared; to the hand it feels just like the other.

23rd.—Has had an elastic bandage applied to-day from the toes to the hip, so as to allow her to get up for Christmas.

30th.—The limb was measured to-day and found to be $18\frac{1}{2}$ inches in circumference, being evidently œdematous, pitting on pressure. This enlargement was clearly due to the girl having been walking about during the Christmas week. The bandage was removed, and the horizontal posture ordered to be maintained.

January 10th.—The girl has been in bed since the 3rd, with the leg raised and without the bandage. The œdema of the limb has entirely subsided, the calf measuring $17\frac{5}{8}$ inches.

17th.—The calf measured 17 inches.

24th.—Ditto	$16\frac{7}{8}$	,,
31st.—Ditto	$16\frac{3}{8}$	,,
February 8th.—Ditto	$16\frac{1}{4}$	,,
14th.—Ditto	16	,,

21st.—The induration in the calf of the leg has nearly disappeared, one portion only at the most dependent part feeling harder than natural. The calf measured $15\frac{7}{8}$ inches.

March 15th.—The calf measured $15\frac{1}{2}$ inches, and to the eye looked natural, very slight induration remaining.

April 15th.—The integument of the leg is rapidly contracting, and feels quite natural; all brawniness has disappeared. The girl may be pronounced well. A good elastic stocking ordered. (See Plate V.)

May 29th.—This patient is now quite well. She is walking about the ward without the slightest inconvenience.

Remarks.—It was from the perusal of a memoir on elephantiasis by Dr. Carnochan, of New York, published in 1858, that I was led to adopt the practice which the case just read so well illustrates; for he is, without doubt, the first surgeon who had the merit to suggest that in this disease the main artery of the diseased limb should be obstructed by a ligature, and the boldness to test the value of the idea by its practical application.

His first case was published in the 'New York Journal of Medicine' in September, 1852, and his last in the memoir to which I have just alluded, in 1858.

The following brief abstract of his cases may, perhaps, prove of interest.

Case 1.—Charles R—, a merchant, æt. 27, who was born in Aix-la-Chapelle, but bred in America, became the subject of elephas in the right leg, after an attack of intermittent fever, contracted in Virginia. He was admitted into the New York Emigrants' Hospital in January, 1851, with the right leg presenting a dense, hypertrophied, hard, scaly, and shapeless mass, the calf measuring $19\frac{1}{2}$ inches. The recumbent position, with the use of discutient lotions, bandaging, and the local as well as internal employment of the iodide of potassium, were for some time used without benefit, and on March 22nd, 1851, the femoral artery was ligatured a short distance below the origin of the profunda. The vessel on exposure was found to be changed, so as to present an appearance somewhat like the colour of the aorta of an ox, and to be larger than the common iliac of the human subject. The ligature came away on the eleventh day, accompanied by secondary hæmorrhage. The external iliac artery was then tied by Dr. Hosack, and was found to be about the size of the brachial. This for a time checked the bleeding, but on the following day it again recurred from the orifice in the femoral artery with as much profusion as ever. An attempt was then made to check the hæmorrhage by the application of a tourniquet on the cardiac side of the bleeding vessel, but without success, but when applied on the distal side a complete cessation of the bleeding was secured; from this time everything went on well. On April 12th, or three weeks after the first operation, the leg was found to have been considerably reduced in size, and the ligature came away from the external iliac artery. In June, three months after the operation, the patient left the hospital completely cured.

Sixteen months after this date the patient was reported to be in robust health, and presented no indication of a return of the disease.

Case 2.—On the 17th of April, 1857, Francisco P—, a native of Italy, æt. 39, was admitted into the Emigrants' Hospital at New York with "elephas" of the left leg, of six years' growth, the limb being so large that the patient was unable to follow any occupation, or even to walk; there was also extensive ulceration of the integuments. On May the 23rd the femoral artery was ligatured, the vessel appearing to be healthy and of its normal size. On July 1st, or the fortieth day, the ligature came away. The limb rapidly became soft after the operation, and diminished in size. The ulceration of the skin also soon healed. The man left the hospital on August 24th, three months after the operation, with his limb almost its natural size, and able to walk well with but slight lameness.

Case 3.—Ann O'B—, a native of Ireland, æt. 25, was admitted into the hospital on November 27th, 1857, with elephas of the right leg of one year's growth, the disease having been preceded by pain in the part for four years previously. On admission the foot, especially on the dorsum, was considerably enlarged; the leg was much increased in size, the skin presenting thick pachydermatous folds hanging over the ankle-joint, so as to prevent motion at the articulation. The calf on the diseased side measured $3\frac{1}{2}$ inches more than on the sound.

On December 12th, 1857, the femoral artery was tied, the vessel appearing healthy, and on the twenty-eighth day the ligature dropped off. The dense character of the tissues of the leg rapidly became soft after the operation, the folds of integument diminished, and the movements of the ankle-joint could soon be accomplished. The calf of the diseased leg, fourteen days after the operation, had gone down $1\frac{1}{2}$ inch, and when the case was published, in January, 1858, the patient could walk with alacrity. After walking, however, for some

time without a bandage the limb became somewhat enlarged, evidently from œdema, for the tissues were then soft and compressible, and the limb was gradually regaining its natural condition.

Case 4.—Catherine P—, an Irish woman, æt. 26, entered the New York Hospital October 29th, 1857, for elephas of *both* legs. The disease had existed for three years, having been preceded by pain for some years previously. The right leg was the worst. On January 30th, 1858, the right femoral was tied, the vessel being healthy; the ligature came away on the twenty-third day. After the operation the tissues of the limb soon became soft and more natural; the size also gradually diminished.

The patient was so much satisfied with the result of the first operation, that she insisted on the artery of the left side being likewise tied. This was consequently done on April 17th, or two and a half months after the first ligature had been applied. When the case was published, eleven days after the operation, there was a decided amelioration in the condition of the limb, both as regards its diminished size, and the induration of the tissues.

It is to be regretted that no later report of this case has yet been published.

Mr. Statham's Case.—In 1858 Mr. Erichsen has recorded the fact that the late Mr. Statham, of University College Hospital, tied the anterior tibial artery for "solid œdema of the foot," with the effect of reducing the œdema. The patient, who was a middle-aged man, left the hospital relieved.

Mr. Butcher's Case.—In the 'Dublin Quarterly Journal' for 1863 Mr. Butcher has published a case in which he ligatured the femoral artery for elephas in the year 1861. It occurred in the person of Margaret D—, a woman æt. 41. The right leg was the part affected, and the disease had been growing for eighteen years, accompanied with severe

pain in the leg and foot. The calf of the diseased limb measured 5 inches more than the sound, and above the ankle $8\frac{1}{2}$ inches. The femoral artery was tied on November 25th, 1861; the ligature came away on December 26th, and by the end of the sixth month the patient could walk well, without pain, the swelling having nearly all subsided. In May, 1863, eighteen months after the operation, the patient was reported as being still well.

Dr. Fayrer's Case. — In the 'Edinburgh Medical Journal' for November, 1865, there is a case related by Dr. J. Fayrer, of Calcutta, of a Bengalee, æt. 30, who was the subject of this disease in his right leg for seven years; the limb measured below the knee 19 inches, and the progress of the disease had been marked by periodic attacks of fever. On February 25th the femoral artery was tied, the limb becoming rapidly flaccid. On March 15th the patient unfortunately died from pyæmia, but the rapid diminution in the size of the limb, as Dr. Fayrer states, was so marked as to indicate the value of the treatment adopted.

In the 'Lancet' of March 24th, 1866, there is also a case related by Mr. Alcock, of the North Staffordshire Infirmary, in which the femoral artery was tied for elephantiasis, and when the report was made, one month subsequent to the operation, the result promised well.

With this brief outline of all such cases as have been published of "elephas," in which a ligature has been applied to the main artery of the limb for the object of its cure, I propose to pass on to consider the principle of the operation. From the facts which have been laid before this Society the practice certainly appears to be a good one.

The pathology of the disease is but little understood, for the opportunities of investigating its nature in this country are but rare.

Dr. Wise, of Calcutta, in a paper published in 1835 ('Transactions of the Medical and Physical Society of Cal-

cutta,' vol. viii), looked upon the disease as one of the venous system, and, what is more, as inflammatory; the evidence he adduces, however, to support this theory is not satisfactory.

Some authorities are disposed to regard the disease as one of the absorbent and lymphatic glandular system; others as a chronic inflammatory thickening of the skin and cellular tissue. Dr. Carnochan, in his memoir, mentions a condition which he looks upon as a fact—although he fails to give us the grounds of the opinion—that the disease is due to the morbid condition and dilatation of the principal arterial trunk of the member affected, and it was upon this idea that he was led to adopt the practice which the cases quoted appear to justify, although the observation as to the dilatation of the main vessel of the diseased limb has yet to be confirmed.

In the case I have just recorded the condition of the iliac vessel appeared to be sound, and in a second, in which I performed amputation of the leg in the year 1864, the vessel was also good. In all of Dr. Carnochan's own cases, with the exception of the first, the femoral artery has been described as being healthy.

What, then, it may be asked, is the pathological condition of a limb the subject of elephas? Dr. Wilks has described it "as a disease due to an exudation of lymph into the skin and subcutaneous tissue, whereby the former is hypertrophied and an immense thickening is produced beneath it, and, at the same time, the fat is often much increased in quantity. The skin also becomes brown, and a number of fissures occur, which subsequently change to oozing ulcers. In a true West Indian example of this affection the cuticle was found very much thickened and of a dark colour; the cutis was also thickened, and beneath there was a quantity of adventitious fibrous material and fat. The bones were healthy, and the veins leading to the diseased parts were exceedingly thickened. The state of the lymphatics was not made out." (Wilks' 'Pathological Anatomy,' p. 177.)

The pathological observations I have been able to make tend to prove the accuracy of these views, although it must be added that the condition of the veins, which Dr. Wilks has described as being thickened in the true West Indian example of elephas, is not the usual one as found in the majority of the cases occurring in this country. I had an opportunity of seeing the case described by Dr. Wilks, and the thickened patulous mouths of the veins in the diseased tissues were very marked, but in no other of the half-dozen or so of cases which I have been fortunate enough to see was the same condition present.

The case I have just brought before your notice tends to prove the fallacy of the opinion that this affection is due to an inflammatory thickening of the veins of the extremities, for the foot, it will be remembered, was uninvolved in the disease, and was quite free from all œdema; such a condition could hardly have existed had the enlargement of the limb been due to an obstruction of the main venous trunk, for œdema of the most dependent part would, under such circumstances, be looked for as an early symptom.

The microscopical elements of this thickened tissue are mostly uniform in all cases, for free nuclei, cells, and fibres, in all stages of growth and of development, are invariably to be found; the skin and cellular tissue appearing to be infiltrated with the same elements as go to build up a fibro-plastic tumour, the microscopical elements of each being of the same nature; the formative process in the cases of elephas appearing in excess as a diffused disease of the cellular tissue, and in the more common fibro-plastic tumour as a local one, excess of nutritive material and of organizable products existing in both.

Under these circumstances the principle of the operation I have just brought before your notice must be looked upon as rational, and the practice based upon it as scientific; for if the disease of elephas be due to an abnormal effusion of tissue-making elements, to an excess of nutrition in a limb, the attempt to check its progress by the application of a ligature to the main artery by which it lives must be

regarded with favour. But whatever the theory may be upon which the operation has been based, and by whatever process the idea first found expression in the mind of its originator, the practice based upon it must be looked upon as a good one, for the success of the cases which I have just had the pleasure of laying before you has been clear and unequivocal; they tend to show that a new means has been given to the surgeon to cure a loathsome and hitherto incurable affection, and another triumph has been achieved for the science and art of surgery.

DESCRIPTION OF PLATE IV.

Case of Elephantiasis Arabum.

a. 27 inches round thigh.
b. 22½ „ calf.

DESCRIPTION OF PLATE V.

Case of Elephantiasis Arabum after application of a ligature to the external iliac artery.

a
b
c
d

AN ACCOUNT OF A CASE

OF

OBLIQUE INGUINAL HERNIA ON EACH SIDE,

IN WHICH,

THE TESTIS REMAINING IN THE BELLY,

THE HERNIAL SACS DESCENDED INTO THE SCROTUM AND ALSO ASCENDED UPON THE APONEUROSIS OF THE EXTERNAL OBLIQUE MUSCLE.

BY

J. W. HULKE, F.R.C.S.,

ASSISTANT-SURGEON TO THE MIDDLESEX HOSPITAL AND TO THE ROYAL LONDON OPHTHALMIC HOSPITAL.

Received April 24th.—Read June 26th, 1866.

The extreme rarity of the complications met with in the following case is my apology for bringing a short account of it before the Fellows of the Royal Medical and Chirurgical Society.

A man, æt. 27, was admitted into the Middlesex Hospital, January 20th, with strangulated hernia.

The right side of his scrotum was distended by a large globular swelling, which stretched upwards along the groin to the anterior superior iliac spine. The inguinal and scrotal portions were separated by an intermediate narrow part, but an examination under chloroform—for there was too great tenderness to allow handling without anæsthesia—proved

that they were portions of a common *cavity*. Except at its pubic end, the inguinal portion of the swelling was accurately definable—the finger-tips could be dipped under its edge—which made it evident that it was not beneath the aponeurosis of the external oblique muscle, but superficial to it.

In the left groin there was a similarly superficial oblong swelling, also reaching from the external ring nearly to the anterior superior iliac spine. It was flaccid and painless, and felt coarsely granular. The penis was thrust towards the left, and nearly buried by the right hernia. Pus oozed from the urethra. Neither testis could be felt in the scrotum or groin.

He lay on his back with drawn-up knees, tossing restlessly, and crying out from the severity of the pain in the rupture and belly. Pulse small, quick, and compressible; face pale; beads of sweat rolling off his brow; features anxious.

His extreme suffering made him so impatient of being questioned that I could only elicit the bare facts that he had been ruptured since childhood, and that each rupture had been reducible until that morning.

The left was plainly an omental hernia, and not strangulated. Its deviation from the usual course of an oblique inguinal hernia was attributed to the non-development of the scrotum connected with arrested transit of the testis. But the nature of the right, the strangulated, hernia was not so evident. Supposing that the testis was in the scrotum, its concealment was consistent with congenital hernia, and, if inflamed and swollen (he had gonorrhœa), the testis, by preoccupying the scrotum, might have hindered the descent of the protruding gut, and in this way have led to the formation of the superficial diverticulum in the groin.

The taxis in a hot bath having been already tried by the house-surgeon, chloroform was given, and, reduction being still impossible, I operated at once, three hours from the beginning of the strangulation, making a cut one and a half inch long in the axis of the swelling, over the external ring. After dividing a little cellular tissue the sac, thin and trans-

parent as gauze, was exposed. I was obliged to open it in order to reach the ring, which lay deeply behind this part of it. After notching the external ring and cutting three deeper constricting bands, the finger slipped into the belly, and there was no other trouble in returning the gut than that occasioned by its great quantity.

When the sac was empty I swept my finger round the under inner surface of the internal ring in order to make quite sure that the extruded bowel was completely inside the belly, and in doing this I hooked something solid, which, being drawn gently down into view, proved to be the testis hanging from a mesorchion; it was replaced, and the wound closed.

The contents of the sac were several feet of dark red gut, blotched with extravasated blood, and some ounces of bloody serum.

Next morning he passed two copious, very offensive, loose, bloody stools, and he died in the afternoon, the symptoms of acute peritonitis having continued unabated from the hour of his admission.

His body was examined on the following day. The left hernia, that which had not been strangulated, was first dissected.

When the skin and superficial fascia were reflected off the groin a lobulated, oblong, hernial sac, reaching from the superior iliac spine to the bottom of the scrotum, came into view. The upper and outer part of this sac lay upon the aponeurosis of the external oblique muscle, in front of the inguinal canal and Poupart's ligament, its descent upon the thigh being restrained by adhesion of the superficial and deep fascia along the line of the groin. It contained a large mass of omentum and some turbid serum. The great distension of the scrotum by the right hernia had masked the scrotal portion of the left hernia during life. When the external ring, through which the sac extended, and the structures composing the front of the inguinal canal, had been slit, the testis was found behind the omentum in the canal, not fixed to the posterior wall of this latter, but hanging from a fold

of peritoneum drawn from the parietal layer near the abdominal surface of the internal ring.

The anatomical relations of the right hernial sac corresponded exactly to those of the left, the only difference being that the superficial diverticulum did not ascend quite so near to the iliac spine. The entire sac was inflamed, and it contained several ounces of turbid serum.

On opening the belly the omentum was seen tightly stretched and gathered in a fan-like form to the left internal ring. The transverse colon was also pulled down to this latter, but not engaged in it. The abdominal cavity contained many ounces of turbid serum similar to that found in the hernial sacs, and the serous surfaces were everywhere inflamed. Ten and a half feet of small intestine had been strangulated; they were intensely congested and blotched with small submucous extravasations of blood, but the most careful scrutiny with the naked eye failed to discover any breach of the mucous surface—a feature of interest in connection with the copious bloody stools. There were several large extravasations of blood in the mesentery of this portion of bowel.

The right testis hung freely entirely within the cavity of the belly, by a mesorchion drawn from the parietal peritoneum at the pelvic brim near the internal ring.

In ruptures associated with malpositions of the testis, where this has remained at some point above the scrotum, the bowel has occasionally been found to have slipped by it into the scrotum, being in these cases received in the vaginal process of peritoneum when the testis or epididymis has entered the internal ring, but acquiring a sac when the testis or epididymis continues in the belly. More rarely the sac, on leaving the external ring, has been found to have ascended upon the aponeurosis of the external oblique muscle instead of passing into the scrotum, the commonly accepted explanation being the resistance to the descent of the sac offered by the undeveloped scrotum.

The case which I have described combines both these

irregularities—the ascent of the sac superficially along the groin, and its descent into the scrotum. Their occurrence is explainable by supposing that the undeveloped scrotum was sufficiently inextensile to retard, but not altogether to prevent, the descent of the hernia. The hernial sac on each side was an acquired one, and not a derivative of the vaginal process, since the right testis and epididymis were within the belly, and the left testis, although found in the inguinal canal, was not attached to it, but hung freely from a long mesorchion attached inside the belly.

AN ACCOUNT OF A SECOND CASE

IN WHICH THE

CORPUS CALLOSUM WAS DEFECTIVE.

BY

J. LANGDON H. DOWN, M.D. Lond.,

ASSISTANT-PHYSICIAN TO, AND LECTURER ON MATERIA MEDICA AT, THE LONDON HOSPITAL; PHYSICIAN TO THE ASYLUM FOR IDIOTS, EARLSWOOD.

Received April 24th.—Read June 26th, 1866.

In the forty-fourth volume of the 'Transactions' of this Society I furnished the details of a case in which there was a marked defect in the great commissural connections of the brain, associated with grave defect of the intellectual faculties. I, at the same time, compared the case under review with all others of a similar nature which I could find recorded.

Another instance having come under my notice which illustrates, in a characteristic way, this rare abnormality, I am desirous of placing it on record in the 'Transactions' of the same Society which already contains descriptions of the best-marked examples.

A. B. came under my observation in the autumn of 1858. He was the son of a clergyman, and had been submitted to the ordinary process of education with but trifling results. He had been taught to write a little, but

he never exercised the art. He had learned to read easy words, and could answer simple questions. His power of calculation was almost *nil*. He was fond of music, had slight power of imitation, and his memory, although defective, was good in relation to persons and things. He was five feet four and three quarter inches in height, and weighed ten stone one pound. His trunk was well formed, and his facial expression that of an imbecile. He was shy, undemonstrative, fond of children (some of whom he petted), while towards persons of his own age and to the opposite sex he was violent and passionate. His friends were very desirous of asserting the non-congenital nature of the mental condition, and attributed it to masturbation. The diagnosis formed, however, was that it was congenital, and that the masturbation was an accidental circumstance. This diagnosis was strengthened by reference to the other members of the family, who, although occupying good positions in the world, were manifestly not of average intellectual power. The habit of masturbation became entirely broken, and he gave himself up to simple employments, such as wheeling invalids in a Bath chair, and otherwise aiding those whom he petted.

He lived to forty years of age, when he died from pleuro-pneumonia. An autopsy was made thirty hours after death. The circumference of the head was $21\frac{1}{4}$ in.; the bilateral curve $11\frac{1}{2}$ in.; the antero-posterior curve 12 in.; the bilateral diameter $5\frac{8}{10}$ in.; the antero-posterior diameter $6\frac{7}{10}$ in. The calvarium was unsymmetrical and dense, shelving anteriorly; the posterior clinoid processes were converted into sharp needle-like points; the encephalon weighed 2 lb. 14 oz. On separating the two hemispheres the almost entire absence of the corpus callosum was apparent, and the velum interpositum exposed to view. A small cartilaginous-like band, $\frac{7}{24}$ in. in breadth and $\frac{1}{24}$ in. in thickness, situated opposite the corpora striata, was the only representative of the great commissure. The fornix was represented by two thin posterior pillars; the body of the fornix and its anterior pillars were absent. The right optic thalamus was very much larger than the left. The cineritious portion of the brain

was pale, the posterior cornua of the lateral ventricles were distended with straw-coloured serum, and the Pineal gland was the size of a wild cherry. The middle commissure was absent. The rarity of this abnormality may be indicated by the circumstance that it is only the second time I have met with it in the dissection of 150 brains of idiots.

REMARKS

ON

CHRONIC ALBUMINURIA

ORIGINATING DURING THE CONVALESCENCE FROM SCARLET FEVER AND OTHER ERUPTIVE DISEASES.

BY

HERMANN WEBER, M.D., F.R.C.P.,

PHYSICIAN TO THE GERMAN HOSPITAL.

Received May 5th.—Read June 26th, 1866.

It is not my intention to discuss the well-known acute scarlatinal dropsy, but the occurrence of a chronic form of albuminuria at a later period, at a time, in fact, when the cycle of the disease is generally considered as completed and perfect convalescence as established. While in scarlatinal dropsy our attention is easily arrested by the more or less sudden appearance of anasarcous swelling and constitutional disturbance, the phenomena of the chronic albuminuria in question intrude themselves much less on our senses, and may therefore be overlooked in their commencement, not only by the patient, but also by the medical attendant. Before proceeding further I will give a short description of the principal cases which lead to these remarks.

CASE 1.—*Scarlet fever without dropsy—Two months later chronic albuminuria—Recovery after several months—A year later a second but milder attack of albuminuria, likewise with a favorable termination.*

B. S—, æt. 14, a boy well developed, but of delicate appearance, had scarlet fever in January, 1854; eruption general, angina rather severe, but perfect convalescence at the end of the fourth week. The almost daily examination of the urine had never shown a trace of albumen, nor had there been at any time the slightest dropsical swelling. A fortnight later the urine was again examined, and found free from albumen. The boy was in good health, and returned to school, where he began his work with even more than usual zeal; but after rather less than three weeks he occasionally had headache, which was increased by mental work; at the same time the appetite began to fail, and later he had sometimes vomiting, especially in the morning. Five weeks after his return to school, and eleven weeks after the outbreak of the scarlet fever, I saw the boy again, and found him pale, emaciated, listless, easily fatigued, complaining of frontal headache, which at times disappeared, at other times was very severe; no pyrexia; no dropsical swelling; no lumbar pain; urine in rather increased quantity, between 50 and 60 ounces in twenty-four hours, sp. gr. 1018 to 1022, transparent, slightly acid, loaded with albumen, and showing under the microscope occasional granular tube-casts.

The treatment consisted in rest, flannel clothing, nourishing diet, with a small quantity of hock, a mixture of an acidulated solution of acetate of ammonia with the tincture of the sesquichloride of iron, similar to that recommended by Dr. Basham,* in his Croonian Lectures; at the same time the bowels were frequently acted upon by means of small doses of elaterium and jalap, and the skin by hot-vapour baths. Under this management the albumen had entirely disappeared from the urine, and the lad had also otherwise

* "The Significance of Dropsy," 'The Croonian Lectures for 1864.' By W. R. Basham, M.D. J. Churchill, 1864, p. 54.

recovered his health by the end of July, 1854. In February, 1855, he suffered again, though in a milder way and for a shorter period, from albuminuria, probably in consequence of over-fatigue and exposure to wet. In October of the same, and in June of the following year, I had the opportunity of ascertaining the continuance of the healthy condition of the urine, after which time I lost sight of the case.

Case 2.—*Scarlet fever, without renal complication, in a child—Several weeks after recovery albuminuria with epileptiform fits—Albuminuria never entirely disappearing in spite of otherwise good development—Death from broncho-pneumonia with uræmic symptoms seven years after the scarlet fever—Waxy kidneys.*

C. A—, æt. 7, an apparently healthy girl, but belonging to a phthisical family, had a moderate attack of scarlet fever early in April, 1854; was seen for the last time five weeks after the commencement, was then to all appearance perfectly recovered, without there having been at any time a trace either of albumen in the urine or of dropsy. On July 28th of the same year, viz., more than three months after the beginning of the scarlet fever, I saw the child again with epileptiform convulsions, and scanty, highly albuminous urine, without dropsy. The history was that in the beginning of June, viz., two months after the beginning of the scarlet fever, she lost her appetite; that soon after this the glands of the neck became swollen, and the sleep at times disturbed, while at other times she was for days very drowsy; until suddenly, on July 28th, she was seized with violent convulsions, recurring in paroxysms during three successive days. (Dry cupping over the loins, blister to the nape of the neck, elaterium and jalap.) After the cessation of the convulsions the child soon regained its consciousness; and under a similar treatment as described in Case 1 the albumen and the tube-casts disappeared almost entirely from the urine, and the general health became much improved. In the following winter, however, a similar attack

of convulsions took place, when I had repeatedly the advantage of the advice of the late Dr. Bright, who recommended an analogous treatment to that adopted in the former attack. The urine from that time always exhibited a few transparent tube-casts and a trace of albumen, excepting the early morning urine, which usually was free; and there was also occasionally a slight degree of anasarca, especially on the legs. In the autumn of 1861, during a severe attack of broncho-pneumonia, the urine became very scanty; convulsions and coma supervened, in which she died. The post-mortem examination manifested waxy degeneration of the kidneys, a certain degree of fatty degeneration of the heart, œdema of both lungs, with red hepatization of the lower lobes.

Case 3.—*Scarlet fever without renal complication in a man æt. 25—More than a month after recovery first symptoms of albuminuria, which affection has since continued, and still exists.*

F. H—, a well-developed muscular man, had scarlet fever of a moderately severe type, in October, 1859; had neither dropsy nor albuminuria during the first five weeks, while under the observation of Mr. Stuckey, of Wellclose Square, and myself. About Christmas of the same year he found his strength much diminished, especially after a long ride on horseback; the appetite became impaired, and the spirits depressed. In February, 1860, he had an eruption of boils, of which new crops appeared at intervals in March and April, when I again saw him, and found him pale and emaciated, with glandular swellings on the neck. He had also increased desire to pass water, and passed between 3 and 4 pints in 24 hours, the colour being clear and transparent, almost as in diabetes; the sp. gr. between 1012 and 1018. It contained no sugar, but a large amount of albumen, a small proportion of urea, many granular casts, and some fatty epithelial cells. Under a similar treatment to that adopted in Case 1 the general health improved, and the

albumen had almost, but not quite, disappeared at the end of two months, the quantity of urea having returned from a low to the average amount. Since then this patient has generally enjoyed good health, with the exception of some attacks of headache and nausea, which are always associated with deterioration in the urine, and yield to steel, combined with drastic purgatives and rest.

It is evident, I think, that the nature of the renal disease in these cases is not identical with that in the so-called scarlatinal dropsy. The latter occurs within the first three or four weeks; it is generally associated with dropsy; the urine in the beginning almost always contains blood, and a certain amount of feverish disturbance is scarcely ever absent; while in the cases under consideration the albuminuria certainly did not originate before the end of the sixth week after the commencement of the eruption, and probably still later; and was unattended with dropsy, with bloody urine, and with pyrexia.

I am aware that sometimes the acute scarlatinal renal affection (desquamative nephritis) is the origin of chronic albuminuria, which latter may manifest itself a longer or shorter period after the apparent disappearance of the former; but to this class the preceding cases can likewise not be allotted, as the urine had been frequently and carefully examined from the beginning of the scarlet fever to the end of the fifth or sixth week, and had always been found free from albumen. I am inclined to regard the relation between the renal affection and the scarlet fever in these cases as entirely different from that in which the scarlatinal dropsy stands to the scarlet fever. While the latter appears to me as much a part of the scarlet fever process as the angina and the eruption and the desquamation, the renal affection under consideration holds a much less intimate connection—perhaps not more intimate than this, that through the scarlet-fever process the entire system is left for some time after the so-called recovery in a peculiar state of deterioration, in which, through unfavorable

influences, morbid dispositions may be created, or existing dispositions developed into actual diseases. This view will gain in probability if it can be proved that not only after scarlet fever, but also after other acute diseases, chronic albuminuria occasionally developes itself—an occurrence which I have been able to witness in the two following cases of erysipelas of the face and of typhoid fever.

Case 4.—*Erysipelas of the head without albuminuria—Several weeks after recovery symptoms of Bright's disease, together with glandular swellings and furunculosis.*

S. E—, æt. 29, an otherwise healthy female servant, was an in-patient at the German Hospital with erysipelas of the face and forehead, in January, 1852. She was discharged as recovered at the end of about four weeks from the beginning of her illness, and was seen once more a week later, when she was still quite well, and returned to service. She never had any albumen in the urine, either during the attack itself or during the convalescence from it. Towards the end of February, *i. e.* about seven weeks from the commencement of the erysipelas, she began to feel weak, and had difficulty in getting through her work. In the beginning of March she observed an enlargement of the glands of the neck and in the armpit, and about three weeks later an eruption of boils, for which she again came to the hospital in April. She was much changed, pale and pasty, but without anasarca; the lymphatic glands of the neck considerably swollen, those of the axillary and inguinal regions to a less degree. There were on different parts of the body eight or nine boils, some in the process of healing, others only commencing. The urine was pale and abundant; she had to pass it several times during the night; sp. gr. 1014 to 1020; containing no sugar, but a large amount of albumen, a small proportion of urea, some granular casts, and some pale transparent casts.

Under the influence of rest, a generous diet, iron, and occasional doses of elaterium, the patient gradually gained

strength and colour. In June the urine was almost free from albumen, and also in other respects improved. For more than four years afterwards she was able to do her work, and enjoyed good health; but in the beginning of 1857, under the influence of over-work and frequent exposure to cold and draught, she had an attack of subacute rheumatic fever, when I had again the opportunity of examining the urine, which contained much albumen and many pale, transparent tube-casts, and was of low specific gravity. She was much improved under a similar treatment to that before adopted, and considered herself quite well when she left this country in the summer of the same year; but the urine always contained a small quantity of albumen and transparent casts, with occasional fatty cells.

Case 5.—*Typhoid fever without renal complication—Several weeks after recovery Bright's disease, with symptoms of uræmia—Perfect recovery.*

M. B—, æt. 24, a strong-looking man, generally in the enjoyment of good health, was admitted into the German Hospital with typhoid fever on February 12th, 1853, having been ill already about ten days. The diarrhœa was rather severe, and the typhoid rose-spots numerous and remarkably elevated; the course of the disease otherwise normal; and the man was discharged as "cured" on March 14th. Had never had any albumen in the urine, either during the height of the disease or later. After having followed his employment as a pedlar, in which he was much exposed to the inclemency of the weather, for three weeks, he felt unusual lassitude, lost his appetite, had frequent desire to pass urine, and a troublesome cough. When he again applied at the hospital, towards the end of April, he was pale, had a slight degree of anasarca of the legs and hands; the urine was highly albuminous, and contained a few blood-globules and granular tube-casts; it had become during the last days scanty, after having been just before rather abundant.

Soon after having returned home from his visit to the hospital, he had epileptiform convulsions, followed by a semi-comatous state. Under the influence of cupping over the loins, enveloping the whole body in a warm wet sheet, and of drastic purgatives, he recovered in a few days from the semi-comatous condition; and later, under such treatment as described in Case 1, the urine became quite free from albumen, and every trace of anasarca had disappeared by the end of July, 1853. In June, 1854, when I had the last opportunity of examining this man, no relapse had taken place, and the urine was in good condition.

To this class must be referred, I believe, Dr. G. Johnson's[1] Case 25, the main points of which are—

J. C—, æt. 28, an otherwise healthy man, had typhus fever in the beginning of December, 1848. No albumen in the urine during the fever; discharged cured on January 3rd, 1849. Towards the end of the same month shortness of breath, puffiness of the face, and swelling of the legs. On readmission into King's College Hospital, on February 17th, considerable anasarca and ascites, with scanty, high-coloured, clear and acid urine, of sp. gr. 1020, containing at first transparent casts with epithelium, but without oil, but a fortnight later with oil and fatty cells. Death on April 1st. The kidneys were enlarged, and belonged to the modification of Bright's disease termed by Dr. Johnson "granular fatty degeneration."

These cases sufficiently show, I think, that chronic albuminuria may originate, not only after scarlet fever, but also after other eruptive fevers, and, perhaps, after all acute diseases, although I am inclined to think that the presence of an animal poison in the eruptive fevers, and the further changes produced by it in the blood—changes which probably disappear only very slowly and gradually—may cause a greater disposition to renal affections than is caused by

[1] 'On the Diseases of the Kidney, &c.' By George Johnson, M.D. London, 1852, p. 408.

other acute diseases, as simple bronchitis and pneumonia. They teach us also, to use Dr. Johnson's words, "the importance of watching fever patients during their convalescence until the health is quite re-established." Over-exertion and exposure to cold and damp air ought to be particularly avoided; the diet, the dress, the habitation, ought to be considered.

I would further point out the insidiousness with which the disease has developed itself in the preceding cases. Lassitude, anorexia, swelling of the lymphatic glands, anæmia, eruption of boils, increased desire of micturition, were the principal symptoms; the more common renal symptoms—anasarca, admixture of blood to the urine, and lumbar pain—were altogether absent in four out of the five cases, and but slightly marked in the fifth. This shows the necessity of always examining the urine under such circumstances, even if the usual "renal symptoms" are absent. An early diagnosis is all the more important as we have then, with appropriate treatment, a fair chance of a cure, as Cases 1 and 5 demonstrate. Flannel dressing, rest, a moderately nourishing diet, the administration of drastic purgatives, especially elaterium, to relieve the work of the diseased organ as much as possible, iron, and also the occasional use of the hot-vapour bath and the warm wet sheet, were the chief treatment, in the principles of which there is nothing new, but which have been taught by Bright, Addison, Owen Rees, Johnson, Basham, and other authorities on renal diseases.

Finally, the question offers itself, whether amongst the great number of cases of Bright's disease the origin of which is inscrutable to us, a certain proportion may not originate during the convalescence from eruptive fevers, and that thus these diseases belong to the remote causes of chronic renal affections?

ON THE

DETECTION OF LUNG-TISSUE

IN THE

EXPECTORATION OF PERSONS AFFECTED WITH PHTHISIS.

BY

SAMUEL FENWICK, M.D.,

ASSISTANT-PHYSICIAN TO THE CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST; LATE LECTURER ON PATHOLOGICAL ANATOMY IN THE UNIVERSITY OF DURHAM.

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It frequently happens that the physical examination of the chest fails to afford decisive evidence of tubercle in persons whose symptoms have led the physician to suspect its presence. Under such circumstances the examination of the expectoration by the microscope for pulmonary tissue has been recommended by various authors, as likely to be of the greatest service.

I have included in the following paper the results obtained from the microscopical examination of the sputa of 100 real or suspected cases of pulmonary consumption, in the hope of showing what advantages we may expect to derive from this method of investigation, and how far the microscope is capable of confirming or correcting the information furnished by auscultation and percussion.

All the cases here reported were treated at the Victoria Park Hospital, either by myself or by my colleagues, and I take this opportunity of thanking them for their courtesy and kindness in granting me opportunities for observation which the out-patient department was unable to afford.

Dr. Andrew Clark has recommended that the expectoration should be poured upon a flat surface, and the particles suspected to consist of elastic fibre should be picked out with needles, and placed beneath the microscope.

Now, although large pieces of lung-tissue can be detected by this method, it is evident that the smaller fragments may be easily overlooked, and that consequently our inability to discover elastic fibre in this way is no sure evidence that none is present in any particular specimen of expectoration.

On this account I have adopted the plan of liquefying the sputa by means of pure caustic soda, when any particles of lung that may be contained in it fall to the bottom of the vessel, and can be removed and placed beneath the microscope.

In order to test the accuracy of this process I performed numerous experiments, of which the following is an example :

One tenth of a grain of lung-tissue was divided by needles into ten parts, and the $\frac{1}{100}$th of a grain thus obtained was placed in the expectoration of a person affected with bronchitis, it having been proved by previous examination to contain no elastic fibre. The mucus was liquefied by boiling it with a solution of pure soda, and the mixture then poured into a conical-shaped vessel. The particle of lung was easily removed and recognised by the microscope.

But as the $\frac{1}{100}$th part of a grain of lung consists of from twenty to thirty air-cells, and as the presence of elastic fibre can be determined with the greatest certainty by means of the microscope in half or even in a smaller part of a cell, it is evident that it might be possible in this way to detect the $\frac{1}{4000}$th to $\frac{1}{6000}$th part of a grain of pulmonary structure in the sputa of patients affected with phthisis. Such minuteness is, however, never requisite, as we need no more

expect to meet with a part of an isolated air-cell in the expectoration than to be consulted by a patient with a single tubercle in his lungs. In one case I counted in the mucus coughed up in only twelve hours, as many as 800 fragments of lung, and we generally find from fifty to sixty pieces even where, from auscultation, we should have expected but a small amount of destruction to be going on.

I have detected numerous fragments of elastic fibre in the mucus expectorated in only half an hour; but as the amount of lung expelled seems to vary at different times of the day, the only safe plan is to liquefy the whole of the sputa of twenty-four hours, or, if it is difficult to obtain the expectoration for so long a period, to examine what is coughed up during the night and early morning.

I have only once found, on a second examination, pulmonary tissue when I had on a previous trial failed to discover it. This was in the case of a patient affected with a cavity of long standing, and in such cases it will be wise for the physician to re-examine the expectoration after a few days' interval, if on the first examination he should fail to obtain evidence of the presence of the elastic fibre.

In phthisis there are, in reality, only two stages, viz., those of deposition of the tubercle, and of cavity; for as soon as softening commences fragments of lung are expelled, and necessarily cavities are produced; but as the microscope should always be used as an adjunct to auscultation, I have grouped the cases contained in this paper under the three stages generally recognised by auscultators, viz., deposition, softening, and cavity.

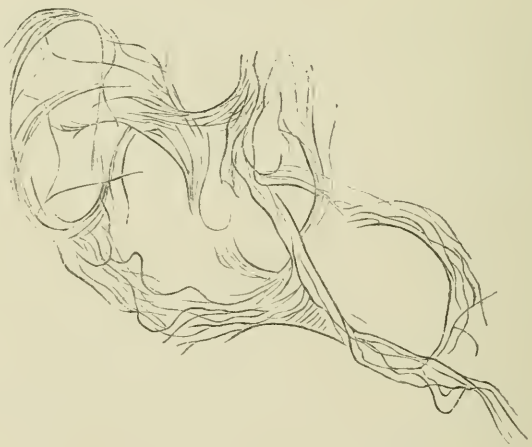
1. *Stage of Deposition of Tubercle.*

The expectoration was examined by the microscope in twenty-four cases in which phthisis in its earliest stage was either suspected or was diagnosed by the stethoscope, and in thirteen of these fragments of lung-tissue were discovered.

In seven of the twenty-four no physical signs of disease in the lungs were found, but the existence of tubercle was suspected either on account of the occurrence of hæmoptysis or from the history of the case showing an hereditary tendency to consumption in persons affected by cough, expectoration, and loss of flesh ; no elastic tissue could be found in the sputa of any of them.

The microscope therefore failed as completely as auscultation in proving the existence of phthisis in this difficult class of cases, and I cannot help suspecting that in many of these the symptoms arise rather from the general derangement of health preceding the formation of tubercle than from an actual deposit in the pulmonary tissue.

Fig. 1.



Portion of lung-tissue as it appears under the microscope.

In sixteen cases auscultation and percussion afforded indications sufficient to justify the suspicion of the existence of tubercle, and in thirteen of these lung-tissue was found in the expectoration. Of the cases in which it was absent one had never suffered from hæmoptysis, and the physical indications were a doubtful deficiency of resonance under the right clavicle, with feeble inspiration, rhonchus existing in other parts of the chest. Another had been ill six years,

and there was deficient resonance under the right clavicle, with feeble inspiration. The third had suffered from hæmoptysis, and presented harsh inspiration and prolonged expiration under the right clavicle.

In the cases in which lung-tissue was found in the sputa some presented deficient resonance on percussion under the

FIG. 2.

Fragments of lung-tissue as they appear under the microscope.

clavicle or in the supra-scapular region. In some there were "clicks of dry rhonchus," diminished or harsh inspiration or prolonged expiration, and in some increased vocal resonance in the apex of the lung, combined with the general symptoms indicating phthisis. All were examined with the double stethoscope. In these the amount of lung-tissue coughed up was smaller than in persons in the later stages of the disease, and the proportion of fragments of isolated air-cells was unusually large, and the pieces of bronchial tubes were of small size.

The microscope is therefore in this stage a most valuable adjunct to auscultation, inasmuch as it shows that in the majority of cases in which physical signs of the existence of tubercle are present softening of the deposit has already commenced, and lung-tissue in small quantities is being expelled. Nor is it of less value when it proves that no

ulceration is taking place, for such a fact should induce us to look hopefully upon such a case, and should encourage us to persevere in our endeavours to ward off attacks of inflammation.

2. *Stage of Softening.*

In twenty-four cases there were well-marked signs of this stage, consisting of a greater or less amount of dulness on percussion, with mucous râles, and in all of these a single trial showed the existence of lung-tissue in the sputa. The amount of lung expelled is generally greater in this than in either of the other stages of the disease. As the other means of diagnosis at our disposal are usually sufficient to point out the true nature of such cases, the microscope will, in all probability, be only useful as a confirmation of the truth of our opinion.

But there is another class of cases in which the stethoscopic indications are more obscure, and in this microscopic investigation is likely to be of the greatest value. The following case is an illustration of this remark.

Case 1.—A man æt. 27 applied at the hospital, complaining of cough, copious expectoration, severe sweatings, and rapid loss of flesh. He had only felt ill for two months, but his pulse was very quick and his voice whispering.

There was no dulness on percussion, but a dry rhonchus was heard on the whole of the anterior part of the chest, and mucous râles were present at the base of each lung. The microscope at once showed the nature of the case by detecting sixty fragments of pulmonary tissue in the mucus expectorated during only five hours.

There is, again, another class which often causes much doubt and anxiety to the practitioner, viz., where rapid loss of flesh and severe night-sweats take place in a person who has for many years been affected with chronic bronchitis. Here the existence of emphysema often masks any dulness on percussion that might otherwise be produced by the tuber-

cular deposit, and auscultation fails to afford decisive evidence as to the actual nature of the disease. Of this the following case is an example.

Case 2.—A man about 40 years of age applied to the hospital with cough, expectoration, and rather rapid loss of flesh and strength.

He had been for four years subject to bronchitis in the winter, but had each summer been relieved, and he felt confident that as soon as the warm weather returned his symptoms would be again alleviated. He had never had hæmoptysis. There was no distinct dulness, and the cardiac region was very resonant on percussion. There was loud and harsh inspiration, both at the front and the back of the chest, with mucous râles below the clavicle. The microscope showed forty-three pieces of lung-tissue in the expectoration.

I examined the sputa of fifteen cases in which auscultation afforded doubtful evidence of the existence of tubercle, and in seven I found pulmonary tissue. On the average, the proportion of bronchial tubes amounted to 14 per cent. of the fragments of lung-tissue in the expectoration. It is worthy of remark that this is nearly the same proportion as was found in the cases which are considered by stethoscopists to be in the stage of "deposition of tubercle," whilst where decided dulness and mucous râles existed the proportion of tubes formed only 9 per cent. May not this difference arise from the tubercle being more deposited in the former class in the mucous membrane of the tubes themselves, whilst in the latter the air-cells are more exclusively affected?

But if the presence of pulmonary tissue in the expectoration of patients in this stage be so general, it will be readily seen that its absence is a most important fact in the history of any particular case. To show the practical bearing of this, I have added the following case.

Case 3.—A woman five months pregnant was admitted

an out-patient of the hospital, complaining of severe cough, expectoration, and great loss of flesh and strength. I thought I detected a little deficiency in the resonance of the right sub-clavicular region, and there were some mucous râles on the left anterior chest, with harsh inspiration at the base of each lung. I could find no lung-tissue in the expectoration, but her general symptoms were so threatening that I re-examined it a fortnight afterwards, and with the same result.

She steadily improved under treatment, and at her last visit reported that her cough and expectoration had both ceased.

3. *Stage of Cavity.*

In thirty-five cases the stethoscope detected signs of cavities in the lungs, and in every instance there was lung-tissue in the expectoration. In one case I failed to find any on the first trial, but on repeating the experiment a week afterwards, with another specimen of the sputa, ten fragments were discovered.

I was disappointed in thus finding elastic fibre in every case, as in a considerable number of the patients the general health had so greatly improved, and the expectoration had so altered in character and decreased in quantity, that I had hoped to have been able to prove the complete arrest of the ulceration to be not infrequent. Two persons with stethoscopic indications of cavities in the lung, whose cases are not included in this paper, denied that they had any expectoration at all.

One patient stated that he only expectorated a little mucus for about half an hour each morning, but even this, when examined, was found to contain twenty fragments of lung. Another coughed up only a little thin semi-transparent mucus in the mornings, and in it were contained eleven pieces of cell-structure and a bronchial tube.

But if the expulsion of the elastic fibre of the lungs is so general where cavities exist, it will be easily seen that

the microscope is likely to prove of value in the diagnosis of enlarged bronchial tubes. I carefully examined the expectoration of two persons in whom I believed this condition to be present, and in neither case could I discover any fragments of lung.

As in all the stages of consumption we find portions of lung in the sputa, it will be interesting to ascertain whether there is any difference in the size of the pieces expelled in different periods of the disease.

In order to discover this I carefully counted the size of the fragments in sixty-nine cases, and from these the following table has been formed.

Table showing the size of the fragments of lung contained in the expectoration of sixty-nine cases of consumption.

Stage according to auscultation.	Fragments of bronchial tubes.	Fragments of single air-cells.	Fragments of from one to six air-cells.	Fragments above the size of six air-cells.	Large fragments.
8 Cases of deposition of tubercle with well-marked physical signs	15 p. c.	41 p. c.	34 p. c.	10 p. c.	—
7 Cases of softening stage without marked dulness on percussion .	14 p. c.	33 p. c.	43 p. c.	7 p. c.	3 p. c.
22 Cases of softening with decided dulness on percussion . . .	8 p. c.	32 p. c.	46 p. c.	12 p. c.	0·5 p. c.
32 Cases of cavity . .	18 p. c.	31 p. c.	37 p. c.	12 p. c.	2 p. c.

It will be remarked that the proportion of bronchial tubes expectorated is smallest in the cases of the second stage, in which well-marked dulness showed the cellular structure of the lung to have been greatly implicated. It is greatest in those in which the signs of cavities existed, probably from the tubes which had formerly escaped destruction being in this stage attacked by the disease. Where

cavities are present the large size of the tubes present in the sputa at once attracts the attention of the observer.

It might be supposed that there would be a great proportion of fragments of cells and an absence of larger pieces of lung in the stage of deposition, where the cavities formed are too small to give rise to the sound of mucous râles, and this the above table shows to be the case.

The proportion of fragments varying from one to six cells is greatest in the softening stage, and we can well imagine that cavernules likely to produce the crepitations so generally heard at this period would be the result of the expulsion of fragments of this size. I have usually found that the size of the fragments of lung coughed up in each case varies according to the sounds heard by the stethoscope; the finer the crepitation, the larger the proportion of the smaller pieces.

The appearance of the elastic fibre itself also varies in different cases. In some it is remarkably thin, whilst in others it is very coarse, granular, and opaque. This latter appearance is generally found in chronic cases, and especially in those with well-marked signs of cavities. I have met with it in post-mortem examinations in the walls of old cavities, and I believe it to indicate previous inflammation of the fibrous structure of the air-cells.

In order that the examination of the expectoration for lung-tissue should be successful considerable care is requisite. A solution of pure caustic soda should be kept ready, about fifteen grains to the ounce of distilled water, and equal parts of this and of the sputa should be used. This mixture should be boiled for two or three minutes in a wide beaker, over a rose gas-burner or spirit lamp, being occasionally stirred with a glass rod. When dissolved it is to be poured into a large conical-shaped glass, and three or four times its bulk of cold distilled water is to be gradually added. It may be then set aside, in order that all the particles not capable of solution in the soda may subside.

The deposit should be placed in very shallow cells for examination. The cells should be cut out of vulcanite of

the thickness of an ordinary visiting-card, and should be fixed to glass slides with cements capable of resisting the action of alkaline solutions. If deeper cells are used there is a great probability that many of the fragments of lung-tissue may be overlooked.

I generally use a microscope fitted with a double arm, carrying an inch-and-a-half and a half-inch object-glass, with the tube drawn out to its fullest extent, and having a No. 2 eye-piece. The intention of this arrangement is, of course, to obtain as large a field as possible, conjoined with sufficient magnifying power.

The chief precaution to be observed is perfect cleanliness of all the apparatus, for the elastic fibre clings firmly to glass. The dipping-tube should be therefore always both brushed out and washed after each examination, or a fresh one should be used on the next occasion.

There is no difficulty in distinguishing the elastic tissue of the lung from other matters that may exist in the expectoration. It is often found clinging to filaments of hair, silk, &c., but in all cases the fineness of the fibres, their regularity and dichotomous division, render detection certain and easy.

The accompanying drawings of the elastic tissue of the lungs, after being boiled in solution of soda, will, perhaps, be useful to those not accustomed to the examination of expectoration in cases of phthisis.

INDEX.

PAGE

Albuminuria, chronic, originating during convalescence from scarlet fever, &c. (Dr. H. Weber) . . . 199
Allbutt (Dr. T. C.), case of premature menstruation . 161
—— case of myeloid transformation of the lungs . . 165
Amputation of the limb, in a case of arterio-venous cyst in the popliteal nerve (Mr. Moore) 29
Amussat's operation for relief of vesico-intestinal fistula (Mr. Holmes) 65
Arterio-venous cyst in the popliteal nerve; amputation of the limb (Mr. Moore) 29
Artery, external iliac, ligature of, in case of elephantiasis arabum (Mr. T. Bryant) 175
Atrophy of the muscles of the upper and lower extremities from disease of the spinal cord (Mr. G. L. Cooper) . . 171

Bryant (Mr. Thomas), case of elephantiasis arabum, or elephas, successfully treated by ligature of the main artery of the limb 175

Chlorides, effect of coffee on, in health (Mr. Squarey) . . 1
Caddy (Dr.) notes on fever in H. M.'s screw corvette Pylades, on the west coast of Mexico, in 1860 . . . 51
Clarke (Mr. Lockhart) examination of the spinal cord in Mr. G. L. Cooper's case of atrophy of the muscles . . 173
Coffee, effect of, on the urea and chlorides in health (Mr. Squarey) 1
Colotomy, lumbar, for relief of vesico-intestinal fistula (Mr. Holmes) 65
Cooper (Mr. G. L.) on atrophy or degeneration of the muscles of the upper and lower extremities, from disease of the spinal cord 171

PAGE

Corpus callosum, second case in which defective [for previous case see 'Trans.,' vol. xliv] (Dr. Down) . . . 195
Cyst, arterio-venous, in the popliteal nerve; amputation of the limb (Mr. Moore) 29

Degeneration of the muscles of the upper and lower extremities, from disease of the spinal cord (Mr. G. L. Cooper) . 171
Down (Dr. J. L. H.), second case in which the corpus callosum was defective [for previous case see 'Trans.,' vol. xliv] . 195

Ear, pathological and surgical observations on diseases of, series viii (Mr. Toynbee) 147
Elephantiasis arabum, or elephas, successfully treated by ligature of the main [external iliac] artery of the limb (Mr. T. Bryant) 175
Eruptive diseases, chronic albuminuria originating during convalescence from (Dr. H. Weber) 199
Expectoration, detection of lung tissue in, of persons affected with phthisis 209

Fenwick (Dr.) on detection of lung-tissue in the expectoration of persons affected with phthisis 209
Fever on board H. M.'s ship Pylades, on the west coast of Mexico, in 1860 (Dr. Caddy) 51
Fistula, vesico-intestinal, lumbar colotomy for relief of (Mr. Holmes) 65

Gordon (Dr. S.), case in which trephining of the spine was performed, with observations by Dr. R. Macdonnell . 21

Harley (Dr. John), case of hydatid disease of the liver, and remarks on the treatment of similar tumours . . 79
—— *Tables* of cases in which cure was attempted by operative proceedings . . . . . 104—145
—— Table I. Cyst opened by single puncture, opening allowed to close by primary adhesion . . . . 104—113
—— ,, II. Cyst punctured twice or oftener, opening allowed to heal up directly (with and without injection of fluid) 114—118
—— ,, III. Tumour punctured once or oftener, and external communication established (ditto) . . 119—136
—— ,, IV. Tumour incised without previous puncture, and external communication preserved . . 137—141
—— ,, V. Tumour opened wholly by caustic potash, or by spontaneous rupture . . . 142—145

PAGE

Hearing, effects of disconnection of the incus and stapes on (Mr. Toynbee) 147
Hernia, oblique inguinal, on each side, the testis remaining in the belly and the hernial sacs descending into the scrotum, &c. (Mr. Hulke) 189
Holmes (Mr. T.), case of lumbar colotomy (Amussat's operation) successfully performed for the relief of a vesico-intestinal fistula 65
Hulke (Mr. J. W.), Case of oblique inguinal hernia on each side, the testis remaining in the belly, and the hernial sacs descending into the scrotum and ascending upon the aponeurosis of the external oblique muscles 189
Hydatid disease of the liver, case, with remarks on treatment (Dr. John Harley) 79
—— *Tables* of cases . . . . 104—145

Incus and stapes, disconnection of, its effects on hearing (Mr. Toynbee) 147

Ligature of the main [external iliac] artery in case of elephantiasis arabum (Mr. T. Bryant) . . . 175
Liver, hydatid disease of, case, with remarks on treatment (Dr. John Harley) 79
—— *Tables* of cases . . . . 104—145
Lumbar colotomy for relief of vesico-intestinal fistula (Mr. Holmes) 65
Lung-tissue, detection of, in the expectoration of persons affected with phthisis (Dr. Fenwick) . . . 209
Lungs, myeloid transformation of (Dr. Allbutt) . . 165

Macdonnell (Dr. Robert), observations on Dr. Gordon's case of trephining of the spine 21
Menstruation, case of premature (Dr. Allbutt) . . 161
Meryon (Dr. E.) on granular degeneration of the voluntary muscles 45
Mexico, fever on board H.M.S. Pylades, on west coast of (Dr. Caddy) 51
Moore (Mr. C. H.), account of an arterio-venous cyst in the popliteal nerve, for which the limb was amputated . 29
Muscles, atrophy or degeneration of those of upper and lower extremities from disease of the spinal cord (Mr. G. L. Cooper) 171
Myeloid transformation of the lungs (Dr. Allbutt) . . 165

PAGE

Nerve, popliteal, arterio-venous cyst in; amputation of the limb (Mr. Moore) 29
Nerves of spinal cord, multiple neuromata of (Mr. Sibley) . 39
Neuromata, multiple, of the nerves of the spinal cord, some cystic (Mr. Sibley) 39

Phthisis, detection of lung-tissue in the expectoration of persons affected with (Dr. Fenwick) . . . 209
Popliteal nerve, arterio-venous cyst in; amputation of the limb (Mr. Moore) 29

Scarlet fever, chronic albuminuria originating during convalescence from (Dr. H. Weber) 199
Sibley (Mr. S. W.), case of multiple neuromata affecting the nerves both within and external to the spinal canal; some of the tumours cystic 39
Spinal cord, disease of, and consequent atrophy or degeneration of the muscles of the upper and lower extremities (Mr. G. L. Cooper) 171
—— examination of, in the above case (Mr. L. Clarke) . 173
—— multiple neuromata of the nerves of, some cystic (Mr. Sibley) 39
Spine, case in which trephining was performed (Dr. S. Gordon) 21
Squarey (Mr. C. E.) on the effect of coffee on the urea and chlorides in health 1
Stapes and incus, disconnection of, its effects on hearing (Mr. Toynbee) 147

Testis remaining in the belly in case of oblique inguinal hernia (Mr. Hulke) 189
Tissue, lung-, detection of, in the expectoration of persons affected with phthisis (Dr. Fenwick) 209
Toynbee (Mr. Joseph), pathological and surgical observations on diseases of the ear, series viii; disconnection of the incus and stapes, and its effects on hearing . . . 147
Transformation, myeloid, of the lungs (Dr. Allbutt) . . 165
Trephining of the spine, case in which performed (Dr. S. Gordon) 21

Urea and chlorides in health, effect of coffee on (Mr. Squarey) . 1

Vesico-intestinal fistula, lumbar colotomy for relief of (Mr. T. Holmes) 65

Weber (Dr. H.) chronic albuminuria, originating during the convalescence from scarlet-fever, &c. . . . 199

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